AD-421 - Annual Research Progress Report

Introduction

The AD-421 is an annual report of a project's research progress and accomplishments. The report consists of responses to seven Questions and a list of Publications summarizing the progress and accomplishments of the research project during the past year. The questions are designed to serve the reporting needs of the Agency as well as to provide progress updates for management's use. Some uses include, but are not limited to:

- To support the ARS budget request to Congress (significant accomplishments – "greensheets").
- To report accomplishments against the ARS Strategic Plan [Government Performance and Results Act (GPRA)].
- To summarize the major accomplishments of each National Program for inclusion in the National Program Annual Reports (NPARs)
- To enable the ONP to respond to countless requests for information throughout the year.
- To retrospectively assess the project's progress towards meeting the goals of the National Program (NP) and to report progress to the next NP Workshop. (by independent external panels and ONP)
- To terminate projects that have passed their 5 year maximum life cycle (expired) during the past year and other projects as appropriate (instrument used for termination).
- Portions of the reports are posted on the ARS website as well as the CRIS/NIFA website for the general public.

   Note: These reports are not used by Headquarters for evaluation of personal performance.

The AD-421 system is open once a year during May through September. In May, the Associate Administrator initiates a memo requesting Research Project Reports (AD-421) for the current fiscal year. The memorandum provides general guidance on preparing the annual report and provides report due dates specific for each reporting year. See memo dated May 4, 2011 to Area Directors, Chapter 15E. 1. Memo (http://www.npstaff.ars.usda.gov/ARIS/Manual/2011%20Annual%20Report%20Memo%20May2011.pdf). Management Units submit annual reports to the Area from May through September. Each Area may set up their own due dates to ensure sufficient time to review and forward their annual reports to ONP by October 1. It is very important to meet this deadline as many Agency reporting requirements which use the Annual Reports are due shortly after October 1.

Reports are required **annually** for all **active** projects (except incoming agreements under $25,000) as well as any **expired** projects to complete the termination process.

Terminating Projects

ARS research projects exist a maximum of five years (60 months) duration. When an in-house "D" project expires, it is replaced by a new project and the funding is transferred to the new project, or the funding is redirected to another existing project. Once funding is transferred from the expiring project, the status of the project is changed to expired ("X"). The 421 Annual Report process terminates these projects. If any subordinate projects expire throughout the year, their status should be changed to expired status and then terminated through the annual report process as well, as long as the agreement is "officially" closed.

Responsibilities for Project Termination

Area Program Analyst/MUs
- Expires (changes status from "A" to "X") sibling project types T, R, S, G, A, M, N, J (RSAs should be expired, but are terminated through the AIMS closeout process; no annual reports for RSAs)
- States in Remarks: 421 progress report required to terminate project

Headquarters Program Analyst (PA)
- Expires (changes status to 'X') 'D' type projects once all funding is transferred
- States in Remarks: 421 annual report required to terminate project, identifies project number that replaces expiring project
- BPMS transfers the funds to an approved project (action is originally initiated by the MU)

Termination Process

When the project status in ARIS is expired ("**X**"), the 421 Annual Report should be entered during the 421 open season. On the Project Info screen, answer "**Yes**" to "**Would you like to terminate this project?**" and submit the annual report for approval electronically. By answering "**Yes**", ARIS will automatically terminate the project at the end of the annual report cycle (approximately December/January). *(Note: See Pg. 5 "AD-421 Exceptions" for more information on projects terminating in the first two months of the next fiscal year)*

To Terminate 'D' Type Projects
- Status should show "X"
- Net to Location dollars must be $0

To Terminate Subordinate Projects (T, R, S, G, A, N, M)
- Project Status should be "expired - X". (Once a project passes its expiration date, status should be changed accordingly).
- **Agreement status MUST be "Closed". (See pg. 7 for additional information)**
- Net to Location dollars are irrelevant.
- **Verify all funding on S, A, or G projects has been used or transferred to another project before the project is terminated. For R & T projects, verify that no additional funding will be received.**
- **NOTE: RSAs (J) do not require 421s. Therefore, termination of these projects will occur during the AIMS closeout process.**

AD-421 Requirements

- All reports of progress on active projects should cover the period October 1 (or start date, if a new project) to September 30 (or expiration date if earlier than September 30).
- The requirement of Annual reports applies to all projects: in-house (D), trust and reimbursable agreements (T & R), specific cooperative agreements (S), general cooperative agreement (A), grants (G), cross-location projects (L), non-funded cooperative agreements (N), memorandum of understanding (M), and other special projects. *RSAs (J) do not require annual reports.*
- If the starting date for a project is June, the scientist should describe the research that is in progress as much as possible, even though data may be limited. "No progress" is an unacceptable response. If a project begins in July or August, the annual report will be required on a case-by-case basis. Consult the Area Program Analyst for additional guidance.
- It is the responsibility of the Lead Scientist of the project to provide information for the research progress report(s).
- Prior year 421s should be provided to the scientist to use as a reference in writing the current year's report. The Lead Scientist is responsible (with consultation of other SYs on the project) for providing the information for the 421 Report.
- **Note: Minimize technical jargon and write for a well-informed, non-technical reader. Scientists should explain their research and accomplishments in terms that average people can read and understand. No SY names or CRADA partners should be listed in the reports. Reports should be short and concise.**

Subordinate Research Projects
Departmental requirements necessitate annual reports for all research projects. All inhouse, appropriated "D" projects require the full report. For all subordinate (sibling) projects, with the exception of the projects designated in Chapter 15E, 1. Memo dated May 4, 2011 to Area Directors, which is distributed each year, only Question 3 (Report of Progress) is required**.** For Question 3, a report of the project's activities during the last year is sufficient. A reference to the associated in-house project **MUST** be included (which is generated automatically by the system). Maximum length for Question 3 is 3,200 characters.

The progress report for subordinate projects will first identify the outside organization and the associated in-house project, which includes the project number and project title. **NOTE: The system will automatically populate this data in. You must review it for accuracy and correct as appropriate**. (Example: "This report documents research conducted under a reimbursable agreement between ARS and the U.S. Fish and Wildlife Service. Additional details of research can be found in the report for the in-house associated project 6225-12320-001-00D, Soil Erosion Research.").

The progress report should link the relationship of the project to the objectives of the related in-house project.

Major accomplishments of the subordinate project (i.e., accomplishments that are candidates for inclusion in the National Program Annual Report, budget documents, and/or GPRA reports) should be captured and reported in the related in-house research project's AD-421. Give credit, as appropriate, to the cooperating institution.

Additional Requirement for Outgoing agreements only (S, G, N, M): The ADODR is required to document monitoring activities for the subordinate project within Question 3. They must state the methods used for monitoring, such as meetings, conference calls, site visits, etc. (refer to the ADODR P&P for more information on this requirement at (http://www.afm.ars.usda.gov/ppweb/pdf/701-0.pdf)*.*

<u>*Note*</u>*: For all inhouse "D" projects, answering Question 3, is* <u>*MANDATORY.*</u>

<u>*If the inhouse, "D" project is terminating during the annual report cycle, Question 3 should be written as such, and briefly summarize the life of the project.*</u>

Scientific Publications
- Only list publications for the current fiscal year, e.g. if reporting for fiscal year 2011, do not list any publications with an October 2011 publication date or later.
- Prior year publication(s) may be listed in this fiscal year's reporting timeframe only if they were not listed in a prior reporting cycle.
- There is no length limitation for publication citations.
- If there are no publications to enter, leave the field blank. "None" or "No Publications" is unacceptable.
- Do not include a publication if it is not **in print.** "In Press" or "Accepted" are not acceptable.
- List publications only once and in association with only one project in a Management Unit. (Note: In Question 3, reference can be made to publications that may relate that are listed on another project).
- Co-authors, located in other management units, may include the publication(s) in annual reports from their own management units.
- Publications must include a complete journal citation.
- The ARS-115 log number is used to select each publication to be entered, therefore, there must be an approved "ARS-115 Manuscript Approval" for every publication.
- Only Peer Reviewed Journal Articles (J); Review Articles (R) related to the subject of the project; Book or Book Chapters (B); Germplasm Registration Articles (H), or Natural Resources Research Update (U) can

be listed under the publication section.

- ARIS will automatically check for use of publications in prior years and on other AD-421s in the same MU (using 115 log numbers). If used in a previous year, ARIS will not allow inclusion in the current fiscal year or within the same MU. ***In addition, once a 115 is used on a 421, the 115 will be marked as "Used on 421" for future reference.***

- See Pg. 17 for more information on Publications. For more information on citation format, see Chapter 5, Appendix 2 of the ARIS Online Handbook.

AD-421 Exceptions

- If a project has a one-year or less duration, an annual report is required. To terminate the project, be sure to answer "**Yes**" to "**Would you like to terminate this project?**" if this is the **only and last report.**

- If the project will expire in the first two months of the next fiscal year (October thru November 30), answer "**Yes**" for both questions on the "**Project Info**" screen. This will then mark the project to be terminated at the end of the current FY annual report cycle (approximately December/January). **Note: Please be sure that the project will not be extended before answering Yes to both questions.**

   Note: This is a two-month grace period. If a project expires within the first two months of a fiscal year (reporting period), an annual report is not required for that fiscal year. The previous fiscal year's annual report (421) will be the final progress report and should be written as such. If the project is not at its five year maximum duration and there is a chance that the project will be extended or receive additional funds, answer the questions "**No**".

AD-421 Questions

1a. Background - Objectives (verbatim extract from the AD-416; no editing on the 421 is permitted).
1b. Background - Approach (verbatim extract from the AD-416; however, must be edited to remove Biosafety Level (BSL) information only).
2. Milestones for FY2011 (currently approved milestones). *Note: For each milestone, indicate the status: fully met, substantially met, or not met by checking the appropriate box in ARIS. If not met, indicate why by selecting from the four options in the List of Values (LOV) provided in ARIS. An "Optional" field is available to give an explanation of milestone status. If the milestone is not met, in addition to the selection of the reason from the LOV, a brief explanation as to why should be provided.*
3. Progress Report *(report of progress for the fiscal year) (Note: NP code, Component, and Problem Statement from the NP Action Plan will be designated through use of a LOV)* **NOTE: NP/C/PS only required for "D" Projects.**
4. Significant research accomplishments during FY 2011 (in order of importance). *(Note: NP code, Component, and Problem Statement from the NP Action Plan will be designated through use of a LOV)*
5. List significant activities that support special target populations.
6. Technology Transfer *(list and give description of the technology transferred in the fiscal year)*
7. International Cooperation/Collaboration *(list any international cooperation/collaboration associated with the project)*

Scientific Publications

Adding the 421

In ARIS, from the Research Documentation screen, click "**Work**" and "**Annual 421 Reports**" (fig. 1). The Annual 421 Records List screen opens with a list of the shells for the projects within the user's mode code that require an annual report (fig. 2).
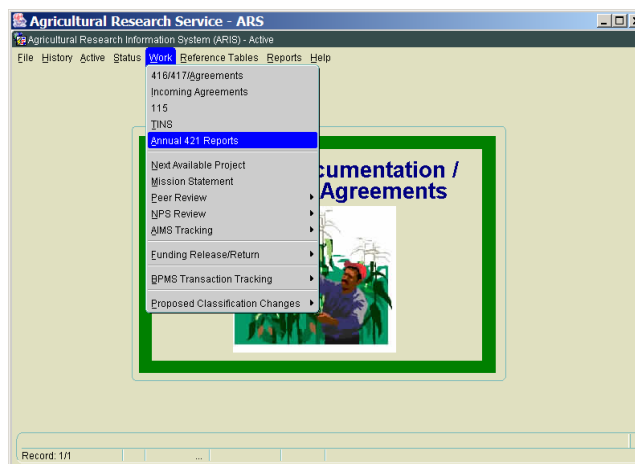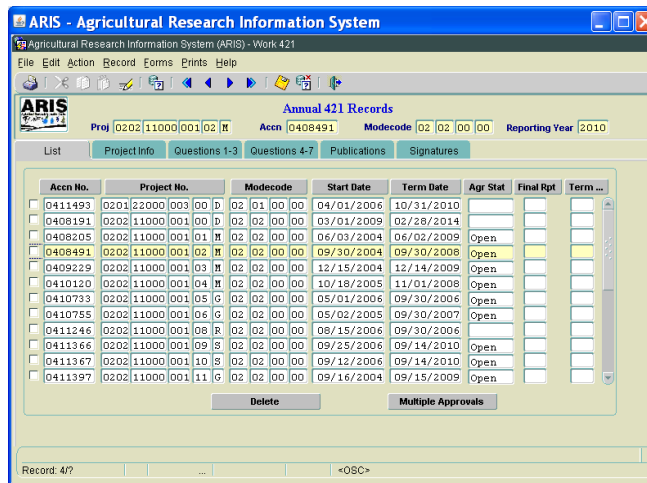

Fig. 1 – Research Doc, Annual 421 Reports

Fig. 2 – Annual Report List Screen

From the List screen, place the cursor on the Project Number and click the "**Project Info**" tab to display the Project Info screen (fig. 3).

Fig. 3 – Project Info Screen

Answer the questions "**Would You Like to Terminate This Project?**" and "**Will This Project Terminate Within the First 2 Months of FY ____?**" by clicking the boxes next to each question and selecting the appropriate answer. (See explanation of questions on pg. 3 and pg. 5)

Note: If terminating extramural projects, be sure that all funds are spent and the agreement is closed. If the project is expired and awaiting closure, mark to "terminate". Once the agreement is "officially" closed, the system will automatically terminate the project if closure is completed after the scheduled termination process.

Note: On the Project Info screen, the Agreement number and Performing Institute fields pertain only to subordinate projects (S, G, M, and N projects) or Source of Funds for R and T projects. These fields are generated by ARIS. No data entry is required.

Data Entry & Using a MS Word File ("Load Questions")

The AD-421 can be manually entered online by clicking from tab to tab and entering the data for each question. Or, it can be entered partially by importing a Microsoft (MS) Word file for Questions 3, 4, & 5 and then entering responses for Questions 2, 6, 7, and publications, which must be entered while online in ARIS.

Question 1a: System automatically inserts data
Question 1b: System automatically inserts data (**must manually remove BSL information**)
Question 2:   Manual entry online
Question 3:   Load questions or manual entry on line; **LOV must be used online to select NP/C/PS designation**
Question 4:   Load questions or manual entry online; **LOV must be used online to select NP/C/PS designation**
Question 5:   Load questions or manual entry online
Question 6:   Manual entry online; system automatically inserts some data based on set criteria.
Question 7:   Manual entry online
Publications: System automatically inserts data; manual entry online as needed by selection of ARS-115 Log Number(s).

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The following formatting instructions for the MS Word file must be followed for correct importing.

Formatting Instructions for MS Word File for Questions 3, 4, and 5:
- Question 3 must begin with the word "Question" and the number (3) followed by a colon (:) (e.g., Question 3:).
- Question 4 must be formatted by using the label "Accomplishment 1: or Accomplishment 2:, etc). **DO NOT USE "Question 4:" as a label for the accomlishments question** (see the example below). This format tells ARIS to insert each response under the correct question. The responses should follow the label, starting on the next line. **NOTE: Each accomplishment should have a short title, followed by a period. The text of the accomplishment should immediately begin after the period (.) and two spaces. No carriage return should be inserted. See example below.** For Question 4, be sure to put the accomplishments in priority order. The system will import them in order. Once imported, if the order is incorrect, they will have to be manually renumbered.
- Question 5 must begin with the word "Question" and the number (5) followed by a colon (:) (e.g., Question 5:).

IMPORTANT!! - MS Word software **MUST** be used with "auto numbering" and "Smart Quotes" turned off. (See Appendix A, Turning Off AutoFormat for Bullets, Lists, Outlines, Smart quotes).

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Example of Format for Word file:

Question 3:
In FY 2011, the development of vaccines to increase the life expectancy of cows was tested and….

Accomplishment 1:
Vaccine to increase life expectancy. A vaccine was developed to increase life expectancy…

Accomplishment 2:
Vaccine to increase life expectancy of sheep. A vaccine was developed and tested to increase the life expectancy of sheep, to live for….

Question 5:
Target populations, including small farms, and underserved farms were addressed…

_____

Once the Word file is complete and saved on your computer, go to the List screen. **Note:** You may want to set up a separate directory for the annual reports and save the files in a uniform manner, e.g., using the accession or project number as the file name. To make the loading process quicker, save the files in a directory on your PC or in an external drive rather than on a network drive.

From the List screen, find the project for which you want to enter a 421, and highlight it by placing your cursor on it or by placing a check in the box to the left of the project number. Click the "**Project Info**" tab. Click the "**Load Question**s" button at the bottom of the screen to open the dialogue box (fig. 4).
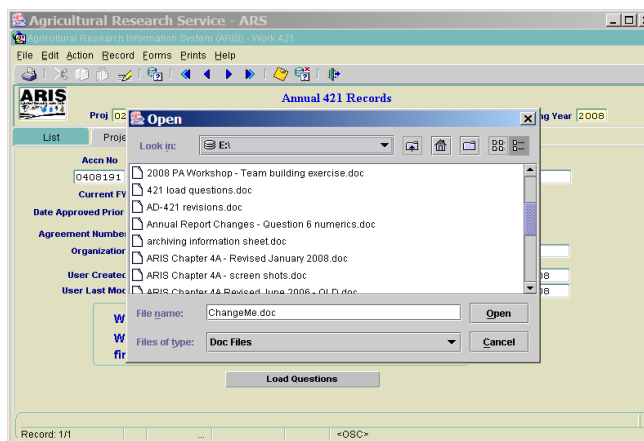
Fig. 4 – Load Questions Dialogue Box

Click "**Look in:**", to find the directory and file name, highlight, then click "**Open**". ARIS will automatically insert the response under each question and return to the Project Info screen. A dialogue box will tell you "**Press the OK button to start the upload** (fig 5a)." Press "OK", and once complete, another dialogue box will tell you that the *"***Document Processing is Complete***"* (fig. 5b). Click "**OK**". *Note: This process takes a few seconds. Do not press any keys until the "Document Process is Complete" message box is displayed.*
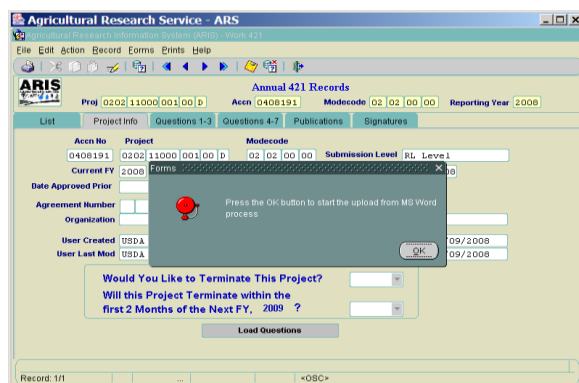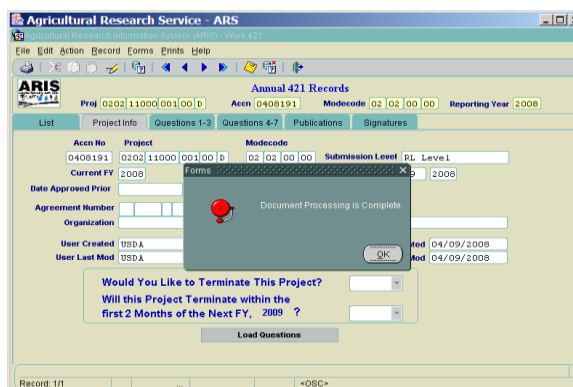

Fig. 5a – Upload Dialogue Box

Fig. 5b – Upload Processing Complete

At this point, Questions 1a, 1b, and 5 are now complete.

Next, click the "**Questions 1-3**" tab to move to the next screen to complete Question 2 (fig. 6). Click the "**Milestones**" button under Question 2 to open the Milestones List screen (fig. 7).
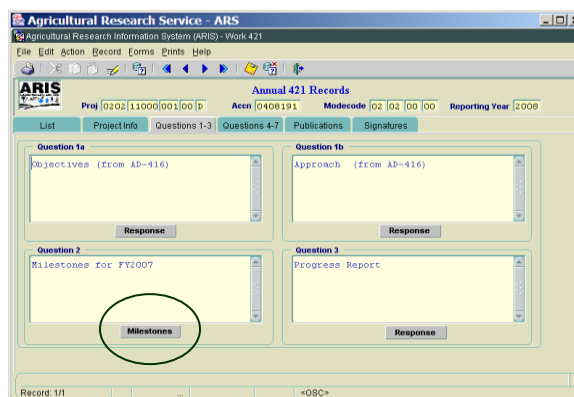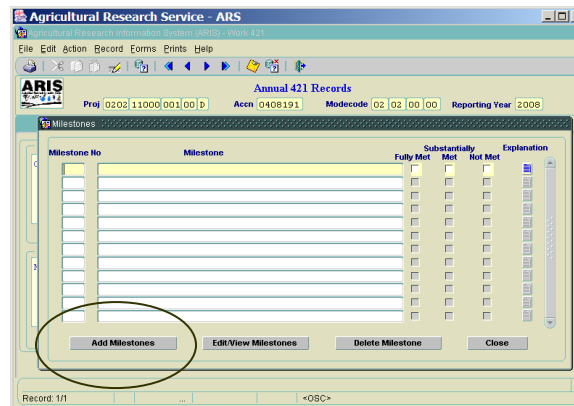

Fig. 6 – Question 1-3

Fig. 7 - Milestones List Screen

To add milestones, click the "**Add Milestones**" button to display the Milestone Data Entry screen (fig. 8a).
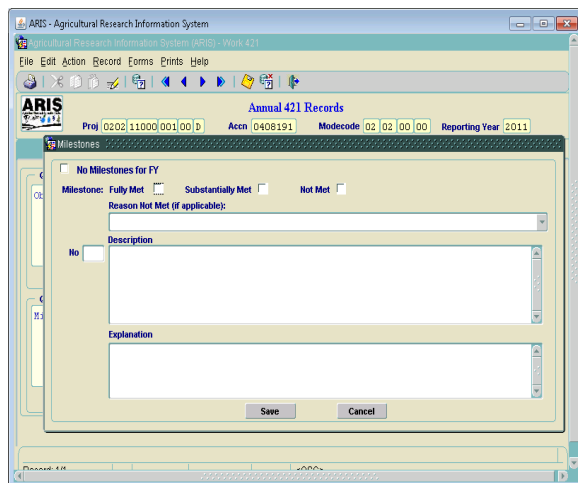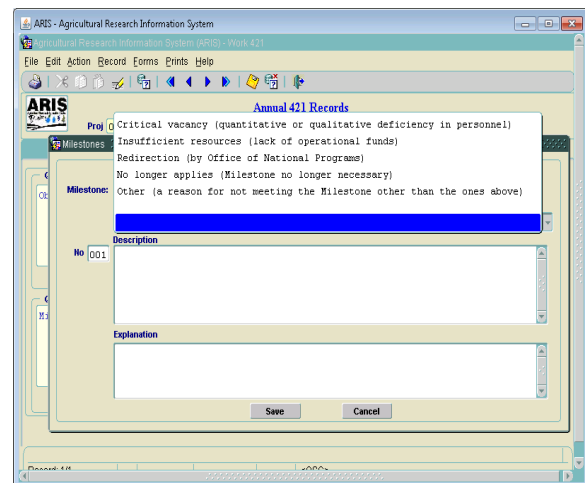

Fig. 8a – Milestones Details Screen

Fig. 8b – List of Values – Reason Not Met

- Enter the milestone number (1, 2, etc.) and the milestone description using complete sentences.
- Enter a brief explanation in the "explanation" box provided (optional). **DO NOT** enter the explanation in the Milestone description box.
- Check only one status box (fully met, substantially met, or not met). If not met, provide the reason by clicking the "**?**" and selecting the reason from the LOV (fig. 8b). In addition, if "not met" is selected, a brief explanation as to why not met should be provided in the Explanation field.
- Click "**Save**" to return to the previous screen where the milestone will now be displayed.
- Continue adding all the milestones that were to be addressed in the FY. When finished, click "**Close**" to return to the Questions screen.
- If no Milestones were to be addressed in the FY, click the "Add Milestones" button, check the "No Milestones for FY" box, and provide a brief explanation in the "explanation" box as to why there were no Milestones (fig. 8c).
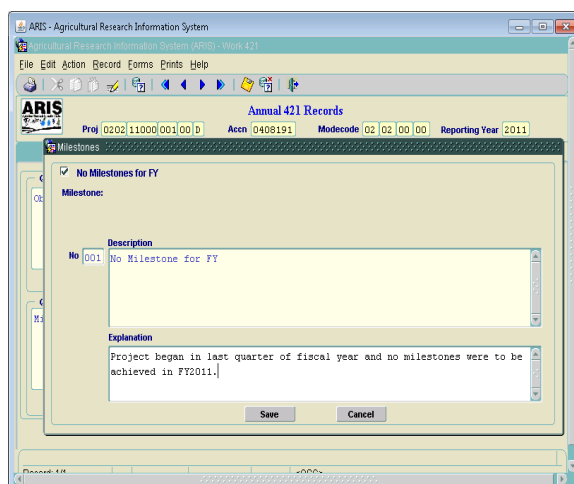
Fig. 8c – No Milestones for FY

Next, go to Question 3 to select the NP/Component/Problem Statement(s) (NP/C/PS) for Question 3-Progress Report by click the Question 3 "Response" button. The Progress Report response screen will be displayed (fig. 9a). If Load Questions was used, the Progress Report will be displayed. If not, enter the progress report in the space provided. **Note: The NP/C/PS is not to be entered directly in the Progress Report. The NP/C/PS designation will be chosen from a LOV as a separate field.**
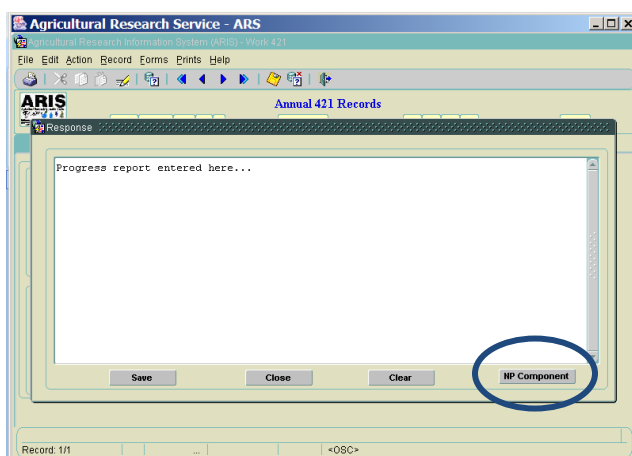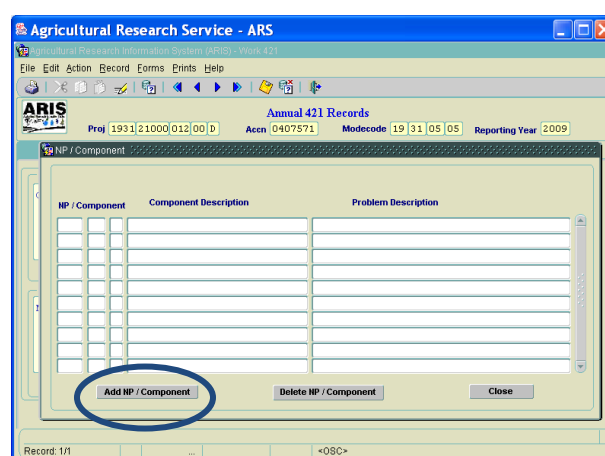

Fig. 9a - Question 3 – Progress Report

Fig. 9b – NP/Component screen

Once the progress report is completed, click the "**NP Component**" button. The NP/C/PS screen will be displayed (fig. 9b). **NOTE: The NP/C/PS is required for "D" Projects only.**

To select the NP/C/PS, click the "**Add NP/Component**" button and a LOV will be displayed. (fig. 9c).
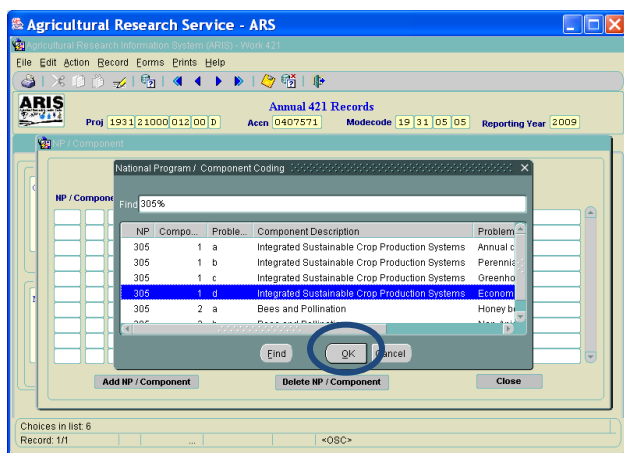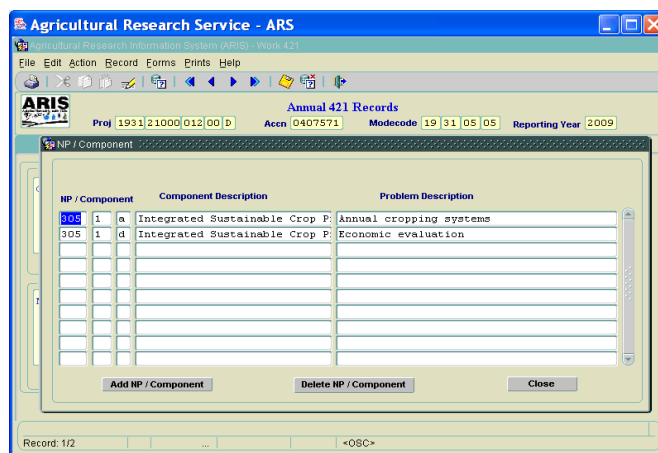
Fig. 9c – NP/Component LOV

Fig. 9d – Completed NP/Component Designations

Select the appropriate NP/C/PS and click "**OK**". The selection will be inserted in the NP/Component screen (fig. 9d). (Note: more than one can be added as appropriate). Note: Only the NPs listed on the project will be displayed for selection.

When completed, click "**Close**" and "**Close**" to return to the Question 1-3 screen.

Next, go to the Questions 4-7 tab. Click the "**Response**" button under Question 4. If "Load Questions" was used, the accomplishments will be listed here. If not, enter the Accomplishment(s), then click the arrow next to the accomplishment (fig. 10a) to go to the NP/C/PS screen (fig. 10b). NP/C/PS must be selected for each Accomplishment listed. **NOTE: This is a required field.**
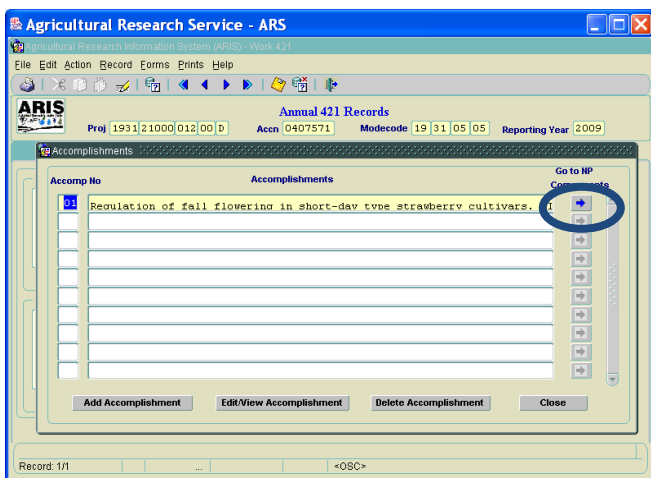
Fig. 10a – Accomplishments screen

Fig. 10b – NP/Component screen
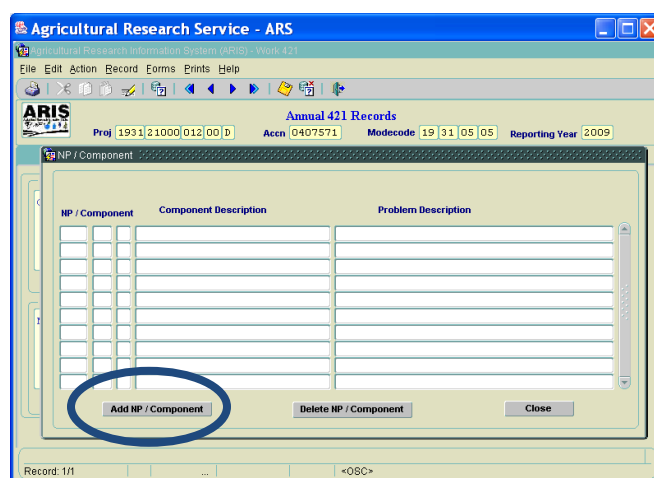
To select the NP/C/PS, click the "**Add NP/Component**" button and a LOV will be displayed (fig. 10c). Select the appropriate NP/C/PS and click "**OK**". The selection will be inserted in the NP/Component screen (fig 10d). (Note: More than one NP/C/PS can be selected, however, it is preferable to limit the number). (Note: Only the NPs listed on the project will be displayed for selection.)
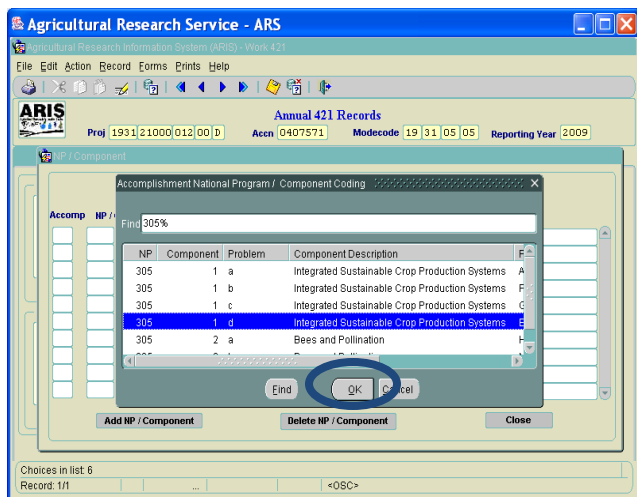
Fig. 10c – NP/C/PS - LOV
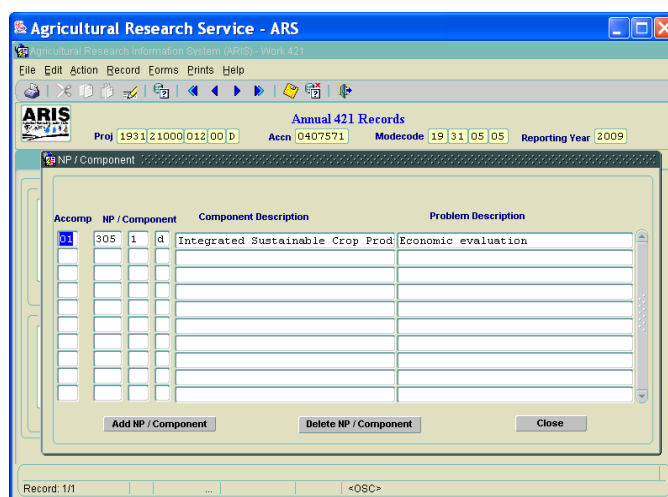
Fig. 10d – Completed NP/Component Designations

When completed, click "**Close**" and "**Close**" to return to the Question 4-7 screen.

Next, enter the responses for Question 6 and Question 7.

Click the "**Response**" button under Question 6 and the Technology Transfer Numerics screen will be displayed (fig. 11a).
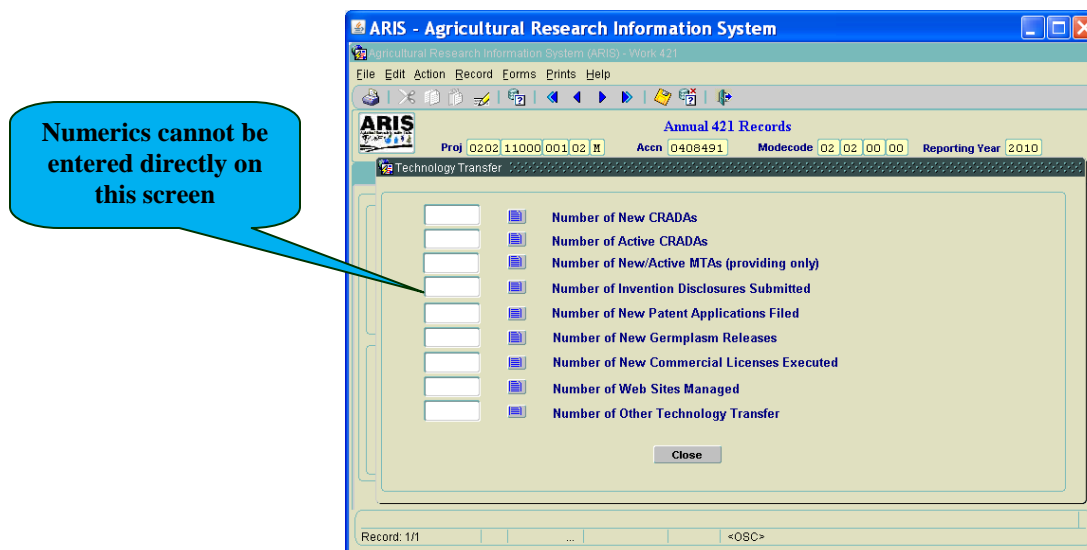
Fig. 11a - Question 6 – Technology Transfer

For each of the numeric fields on this screen, the number will automatically propagate in based on the supporting data entered on the Details screens. The numeric CANNOT be entered or modified directly on the Numeric screen.

For the first seven items on the screen, data will automatically populate the Details screens based on the criteria determined for each numeric (see table below for set of criteria).

Numeric	Data Automatically Propagated	Criteria
New CRADAs	Agreement No., Title, and Cooperator	Start date in FY of report; Status = Active
Active CRADAs	Agreement No., Title, and Cooperator	Start date < in FY; Status = Active
New/Active MTAs (Providing Only)	Trans ID and Material Transfer Description (only new MTAs propagate; all are in LOV for selection)	Providing or Select Agent Providing; Status = not In Negotiations or not Abandoned
Invention Disclosures Submitted	Docket No. and Title (only current FY data propagates in; prior year data in LOV for selection if needed)	FY in Report Year; Utility Invention (U); Plant invention (P); Plant Material is a candidate for Plant Protection (PVPC and/or Patent = Yes + application date is blank
New Patent applications Filed	Docket No. and Title (only current FY data propagates in; prior year in LOV)	Application date within FY of report (Plant or Utility inventions)
New Germplasm Releases	Docket No. and Title (only current FY data propagates in; prior year in LOV)	Plant inventions; FY in report year; and Plant material is a candidate for Plant Protection (PVPC and/or Patent) = No or Null
New Commerical Licenses Executed	Docket No. and Title (only current FY data propagates in; prior year in LOV)	Issue date is in FY of report
Web Sites Managed	None	In FY
Other Technology Transfer	None	Technology transferred in FY of report

If data did not propagate in to the first seven numeric fields and details screen, it means that nothing fit the criteria to be added in that category for the fiscal year report. Therefore, no additional information needs to be entered.

If data is populated in, then the Description fields must be filled in describing the technology transferred, by answering the following questions in complete sentence form for each technology:

Description of the Technology; **(Technology)**
Description of the Transfer**; (Transfer)**
Description of the Customer/User; and **(Customer/User)**
Demonstrated or Anticipated Impact and/or Outcome **(Impact and/or Outcome)** **(IMPORTANT)**

Use the labels, **which are shown in ( ) above, prior to the response for each answer. (see Appendix B for an examples of a response)**

To enter the **required** description information, click the notepad next to the line item (fig. 11b). The Technology Transfer List screen for that numeric will be displayed, which will already have data propagated in (fig. 11c).

Fig. 11b – Tech Transfer screen w/Numerics

Fig. 11c – Tech Transfer List Screen

Click the "**Edit/View**" button to display Technology Transfer Details Screen (fig. 11d).

Fig. 11d – Tech Transfer Details Screen

Enter the required information in the Description field by manually typing or pasting in from MS Word. Maximum character length is 2,000 characters per description. **However, the responses should generally not be that long**.

Once data entry is complete, click the "Save" button and you will be returned to the Tech Transfer List screen. Once data entry is complete for all line items, click the "**Close**" button and you will be brought back to the Tech Transfer Numerics screen.

Continue adding/completing the information for **all** technology transfer items in the same manner.   If data is entered for the last two numerics (Web Sites Managed and Other Technology Transfer), the Description field must also be filled in, answering the same four questions. Data for these two items is not automatically populated and must be entered manually.

NOTE: If data is not available or no technology has been transferred to date, it is okay to answer "no impact to date".

When data entry is complete for Question 6, click the Response button under Question 7 - **International Cooperation/Collaboration**. The Intl Cooperation/Collaboration List screen will be displayed (fig. 12a).

Only answer this question if the project has International cooperation and/or collaboration. This could include agreements with foreign countries and/or any other International cooperation, not associated with an "official" agreement. If there is no International cooperation, go directly to the Publications tab.

Fig. 12a – Intl Coop/Collab List Screen

To enter Intl Cooperation, click the "**Add Collaboration**" button. The Intl Collaboration Details screen will be displayed (fig. 12b).

Fig. 12b – Intl Coop/Collab Details Screen

Fig. 12c – Intl Coop/Collab Details - Completed

Enter Item No., select the country from the LOV, select an agreement number, if applicable, and give a brief description of the cooperative/collaborative effort (1,000 character maximum per item) (fig. 12c). Enter separate line items for each collaborative effort. After each addition, click the save button.

NOTE: Each entry should include a description of the collaboration/cooperation, including the name of the

international institution and a brief description of the research and the overall objectives of the activity. Scientist names should not be listed.

Once all Intl Collaboration(s) have been entered (fig. 12d), click "**Close**", then, click the Publications tab to move to the Publications screen (fig. 13a).

Fig. 12d – Intl Coop/Collab List Screen - Completed

All publications that meet the requirements for entry on the annual report will be automatically propagated by the system. Each publication should be reviewed for accuracy and additional publications added as needed.

To add additional publications, click the "**Add Publication**" button to display the Publication Details screen (fig. 13b).

Fig. 13a – Publications Screen

Fig. 13b – Publications Details Screen

Enter the publication number (e.g., 01, 02, 03.....). The publication number is a sequential number for the list of publications. Click the "**?**" next to the 115 Log number field to display the 115 Log Number Reference screen (fig. 13c). Search for the 115 by entering the log number with "**%**" before and after the number (e.g., %195046%) on the "**Find**" line. Click "**Find**". When found, click "**OK**" (fig. 13d). ARIS enters the log number, as well as the

citation information (fig. 13e). Click "**Save**" to return to the Publication screen where the publication is now listed (fig. 13f).
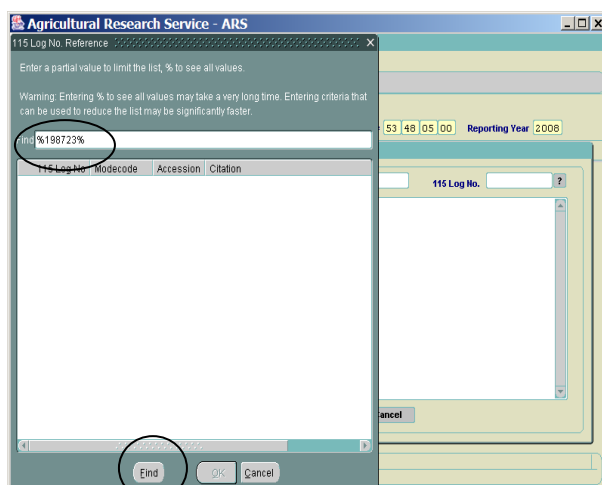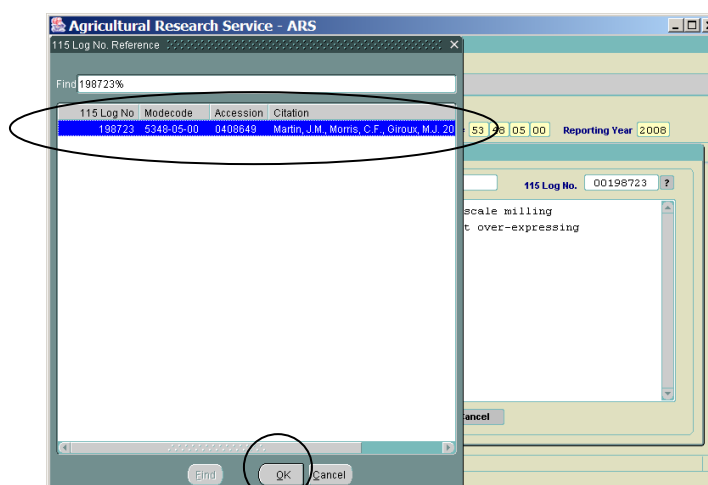

Fig. 13c –Log No. Reference Screen

Fig. 13d - Log No. Query and Selection
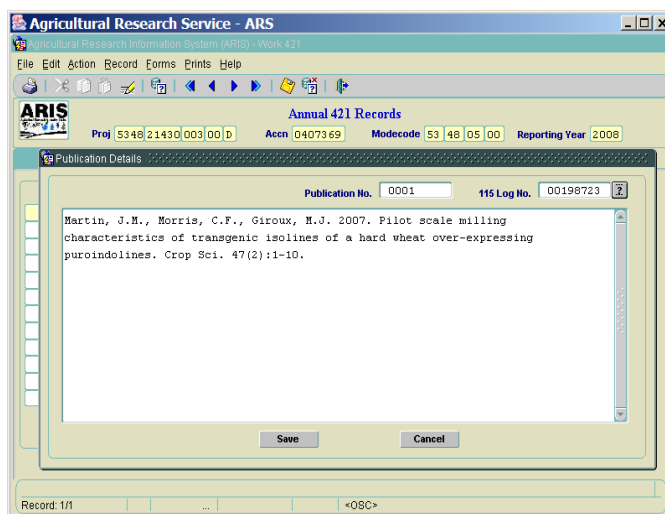
Fig. 13e – Citation Entry from ARS-115
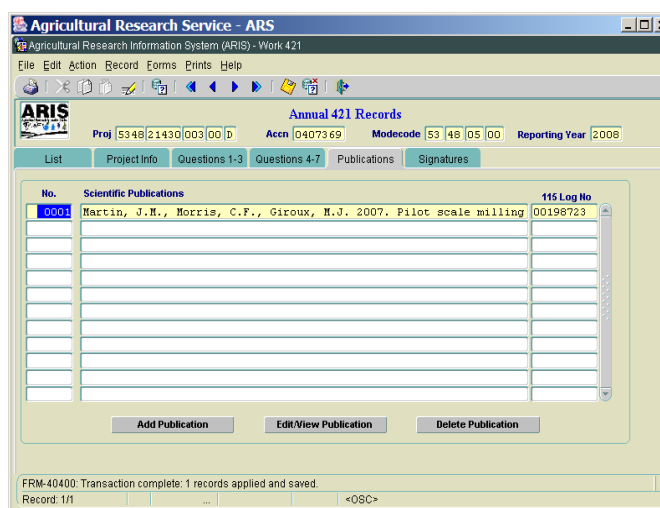
Fig. 13f – Completed Publication List

Note: Citations cannot be modified on the 421. Therefore, if incorrect, the data will need to be corrected by creating a Work 115 record and modifying as necessary. Once modified, the changes will automatically be propagated to the 421.

To delete a publication, highlight the publication and click the "**Delete**" button. If necessary, renumber the publications listed as appropriate.

Continue adding all the publications. Once complete, click the "**List**" tab to return to the List screen.

Data entry of the 421 Annual Report is now complete.

Text Field Sizes

Question:	Maximum Size:
Question 2: Milestones	1,000 characters per milestone; 500 characters per description
Question 3: Progress Report	3,200 characters (introductory paragraph for subordinate projects is not included)
Question 4: Accomplishments	2,000 characters each/ maximum of 39 accomplishments per project
Question 5: Target Population	Unlimited
Question 6: Technology Transfer	2,000 per description field
Question 7: International Cooperation	1,000 characters per description field
Publications	1,500 characters per citation

Modifying 421s

To modify a 421 Annual Report before approving, highlight the 421 from the List screen, then click the tab (Project Info, Questions 1-3, Questions 4-7, or Publications) and modify the text. When modified, click the "**Save**" button.

If an entire response is incorrect, use the "**Clear"** button at the bottom of the Response page to clear the entire response. Then, add the new response. Once modifications are complete, print and/or approve the 421.

Note: If the entire 421 needs replacement, click the "**Load Questions**" button and enter the revised MS Word file. The new file will overwrite the responses currently in ARIS for Questions 3, 4, and 5. Questions 1a, 1b, 2, 6, 7 and publications will not be impacted by the reload. Modify these online as necessary.

Printing Listing of 421 Shells

To print a list of 421 shells in your Work file, go to your Work file List screen. Click "**Mark All**" and then click "**Print**" and "**Summary**" or "**Summary w/o Title**."   Adobe Acrobat will display the print file. Click the printer icon to print. The Summary listing includes the project number, accession number, mode code, title, start date, and termination date. The Summary w/o Title will include all of the above without the title. You can print a list of all Active projects and compare the two lists for accuracy. Some projects may have become Active after the initial creation of the Annual Report shells and may need to have shells added. Please contact your Area Program Analyst to have shells added (or deleted).

Printing Templates

To print a template in "Word" for an AD-421, mark the record, click "**Prints**" and "**Template/Extract to Word**". This feature will create a Word document that can be saved and/or emailed to the scientist to fill in and return to the ARIS support for data entry. (See pg. 23 for more information on Extract to Word.)

Printing 421s from Work File

To print, mark the project(s) to be printed on the List screen and click "**Prints**" and "**AD-421**". Adobe Acrobat launches and displays the print file. To print the file, click the printer icon, and press "**Enter**".

Approving 421s

From the List screen, highlight the 421 to be approved and click the "**Signatures**" tab. The Signature screen will be displayed (fig. 14). Enter the signature on the appropriate line, enter the approval date, and check the approved box. Click the "**List**" tab. ARIS will prompt you to save. Click "**Yes**" and ARIS will return to the List screen. The approved 421 will move immediately to the next approval level.

Fig. 14 – Signature Screen

Printing 421s from Active

ARIS provides multiple options for printing an AD-421. The best option is in "**Active**" as it allows printing AD-421s across multiple years. The other locations in ARIS to print 421s only allow printing the most recent FY AD-421.

To retrieve and print a 421, click "**Active**" and "**421**" from the Research Documentation screen (fig. 15) to open a query screen (fig. 16).

Fig. 15 - Active 421 Records

Fig. 16 – Active 421 Query Screen

Enter the query criteria, e.g., NP 103, "D", FY 2005 (fig. 17). Click "**Execute Query**" on the Tool bar to display a list of projects meeting the query criteria (fig. 18).

Fig. 17 - Query - NP 103, Project Type D, FY 2005

Fig. 18 - Query Result List Screen

To print all records, click "**Action**" and "**Mark All Records**". Click "**Prints**" and select the appropriate print option (fig. 19) to open Adobe Acrobat and display the print file (fig. 20). **Note:** When printing large reports, it is best to split the print job into smaller segments.

Fig. 19 – Print Options

Fig. 20 - Adobe Acrobat Print File

Extract to Word

The "Extract to Word" option converts the ARIS AD-421 data to a Word file. To extract to Word, click "**Prints**" and "**Extract to Word**" from the Menu bar (fig. 21). Click the option required and ARIS opens MS Word, displays the AD-421 file and minimizes the Word window. To print, restore the Word window and click the printer icon on the Word Tool bar (fig. 22).
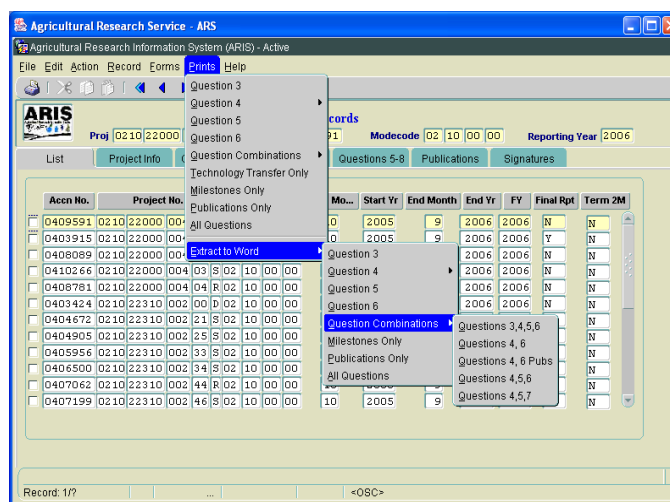
Fig. 21 – Extract to Word Print Options

After minimizing the Word window, ARIS displays a "SaveAs" dialogue box (fig. 23). Change the file name and directory and click "**Save**" (fig. 24). This file can be later retrieved, modified, printed, etc., as needed.
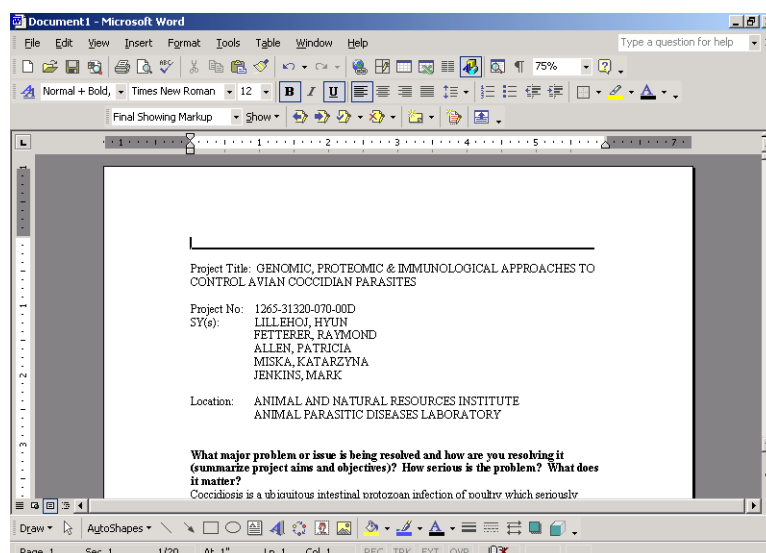
Fig. 22 - Annual Report Extracted to Word
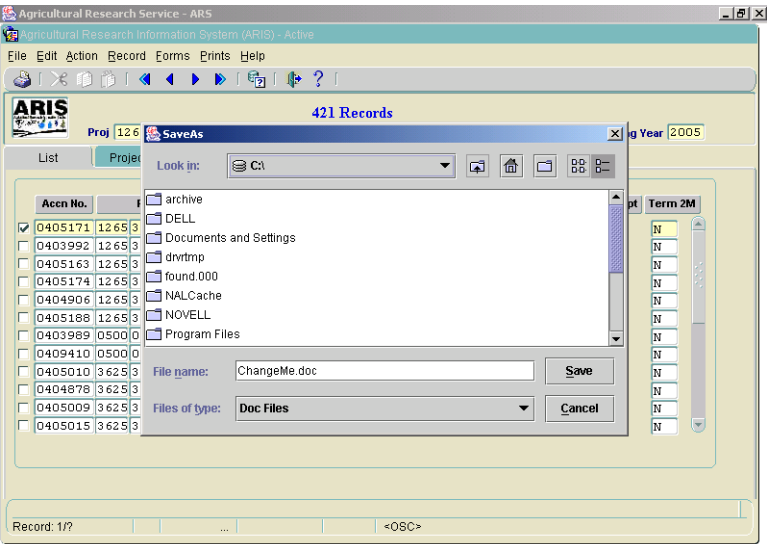
Fig. 23 - SaveAs Dialogue Box
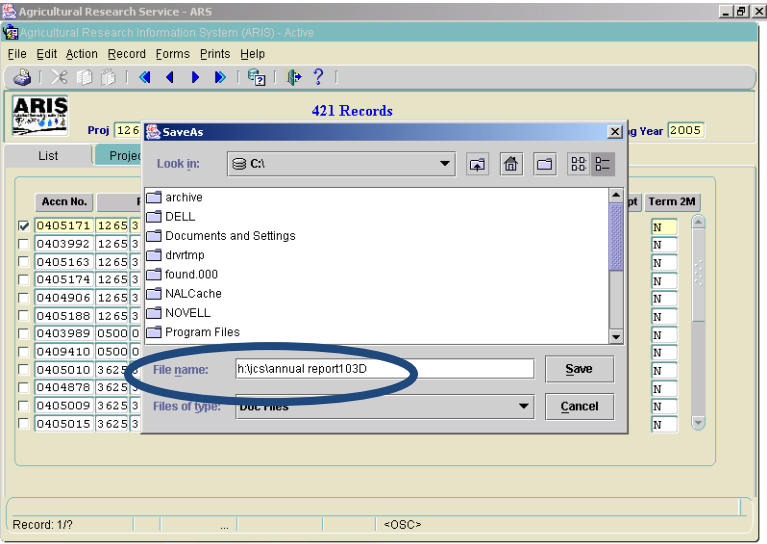
Fig. 24 - Changed File Name and Location

Appendix A

Turning Off AutoFormat for Bullets, Lists, Outlines, and Smart Quotes

To turn off the AutoFormat feature in Word, click the **Office Button** -> **Word Options** -> **Proofing**. This will display the AutoCorrect options Dialogue box (fig. 25). Select the "**AutoCorrect Options**" label in the AutoCorrect Dialogue box (fig. 26).
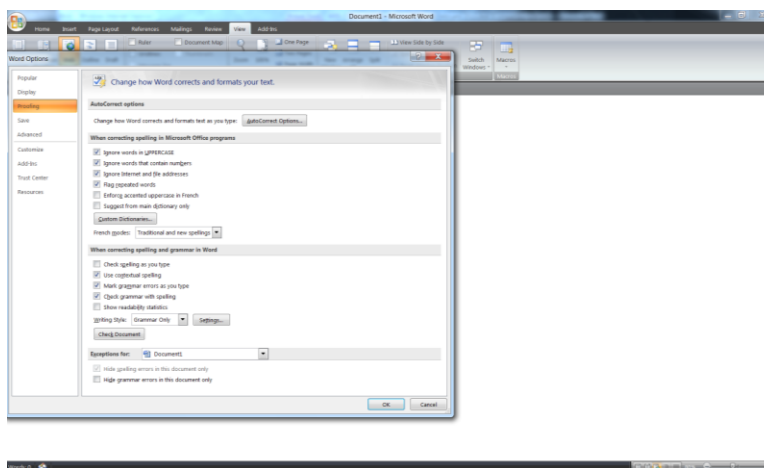
Figure 25 – Word Options-Proofing
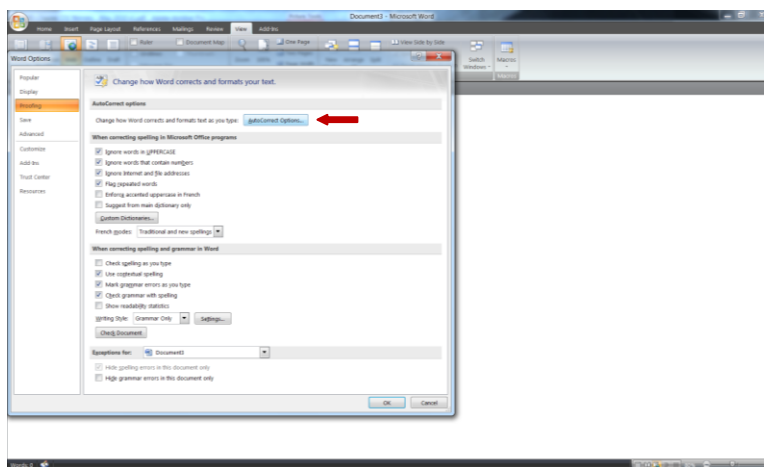
Figure 26 – AutoCorrect Options

Select the AutoFormat tab and clear the checks in "**List styles**", "**Automatic bulleted lists**", and **"Straight quotes" with "smart quotes"** by clicking each box (fig. 27).
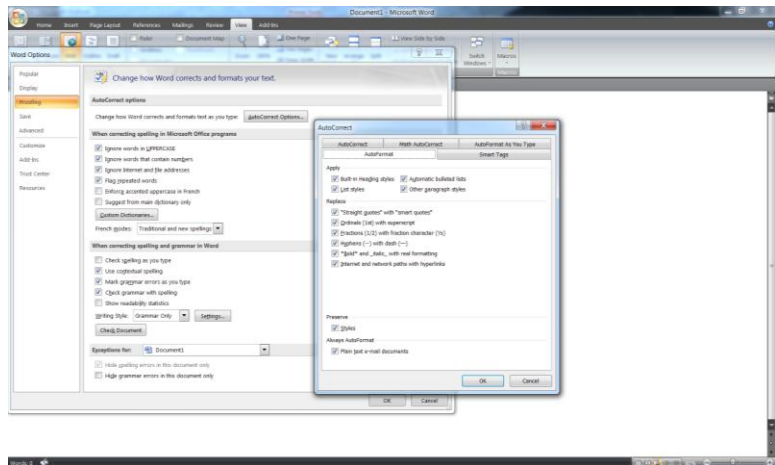
Figure 27 – AutoFormat
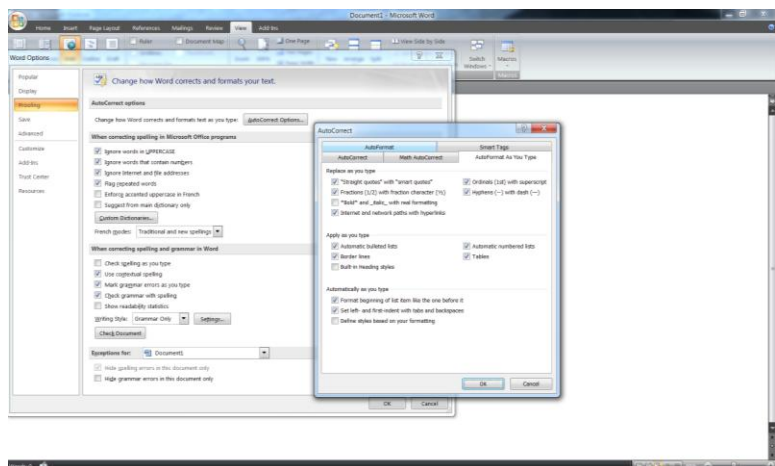
Figure 28 – AutoFormat As You Type

Appendix B

FY2011 Annual Report (AD-421)
Additional Guidance and Examples

Compiled below are some examples of <u>good</u> responses to the individual annual report questions, in addition to responses to some frequently asked questions and additional guidance.

Please NOTE: It is never one size fits all. Research projects differ in scope, content and performance; therefore, responses may need to be handled in different ways. The examples below are to give some general guidelines to follow and show some good responses to use as a guide.

Question 2: Milestones

1. **When old project expired early in the fiscal year and new project was established. No milestones were being addressed on the old project:**

   - Check the box "No Milestones for FY" and enter an explanation, such as:

   "No Milestones were to be addressed in FY2011. Milestones were incorporated into the new in-house Project No. 0206-11000-005-00D"

   Note: It is good to give a connection from the old project to the new project.

2. **Good response to reason why Milestone Not Met (Other):**

   "Collaborations with ARS scientists in Beltsville, Maryland have been re-established to continue our 2011 experiments with ongoing insect work with inbred and hybrid lines of corn. This project has more relevance now since we now know the identity of the fungal inhibitor (surfactin), which is also considered toxic to insects."

3. **Good response for reason why Milestone Not Met (No longer applies):**

   "The extramural project for incorporating the decision algorithms of WeedSite into a farm recordkeeping program was modified this year to address a more urgent need of corn growers in Colorado. The new objective is to develop a decision model to help crop consultants and growers select the time and amount for irrigations when allocating a limited supply of water among corn fields on a farm."

Question 3: Progress Report

1. **Good summary for life of project and explanation of termination:**

   This is the final report for the project 6222-21220-002-00D terminated in January 2009. There was a period between the beginning of FY2009 and the termination date for the project occurring in fall and winter. All

planned field experiments were completed prior to the start of FY2009; no experiments were initiated in the timeframe corresponding to this project.

Substantial results were realized over the 5 years of the project. An organic production system was developed for transplants, with results equivalent to those produced with conventional methods and materials. Addition of bacteria to potting media beneficially affected transplant production. When similarly treated seedlings were moved to the field, effects in the greenhouse did not carry over. In the transition to organic production, multiple crops and inputs were studied and it was determined that production during the transition period is costly but yields increased over time. Inoculation with microbes was not beneficial to plant development and yield in peanut and vegetable crops following peanut. Cropping with early maturing ryegrass could be followed by two additional vegetable crops, with sufficient time to reestablish the cover crop. Greenhouse-grown onion transplants can be established in the field. Yield increased as onion plant density increased; additional fertilizer was not needed. Early harvested onion had more nutrients in bulbs. It is not necessary to apply manure every year in production of organic vegetables. Corn gluten meal can be applied to spring-transplanted onions and non-pungent jalapenos, providing good to excellent early weed control. The synthetic herbicide pendimethalin provided superior weed control and crop yields compared to corn gluten meal. Corn gluten meal can be safely band-applied for weed control to direct-seeded organically grown vegetables. Phytotoxicity, application rates, and incorporation methods of corn gluten meal for direct-seeded cucurbits and beans were determined. The impact of the research was that production systems were designed to give producers flexibility in determining levels of inputs to use to maximize efficiency. Additional impact was that organic post-emergence weed control strategies were developed for early-season weed control; integrated systems need to be developed for season-long control. The application technology can be used with other powdered or granulated materials in organic production. The overall impact of the accomplishments is that producers have new information on which to make decisions concerning production systems to maximize profits while sustaining yield.

Note: This response gave an explanation of the termination as well as a summary of progress for the life of the project. It would have been helpful to give the connection to the replacement project.

2. **Good precise summary which relates back to objectives and problem statements:**

Progress was made on all four objectives and their subobjectives, *all of which fall under National Program 215, Component I, Rangeland Management Systems to Enhance the Environment and Economic Viability. Progress on this project focuses on Problem A, the need for economically viable rangeland management practices, germplasm, technologies, and strategies to conserve and enhance rangeland ecosystems, and Problem B, the need for improved rangeland production systems for rangelands that provide and use forages in ways that are economically viable and enhance the environment.* ***Under Objective A.1,*** *we made significant progress in developing management and monitoring strategies that conserve natural resources. These strategies were developed for arid and semi-arid rangelands in North America and Asia. State and transition models, ground-based indicators, and remote sensing technologies were developed and tested as a suite of monitoring technologies for a broad range of spatial and temporal scales.* ***These technologies also address Objective B.1***, *to develop monitoring tools and management strategies for managers, because they are being adopted by other federal agencies, such as the BLM, in monitoring rangeland status and change. Under Objective A.3, we made significant progress in identifying factors that can be used to predict and minimize rangeland degradation. We made progress toward demonstrating the role of endophytes in stomatal function in plants that can be used to improve revegetation success, with special emphasis on restoring degraded arid grasslands in the southwestern US. Progress was also made in determining the role of landscape context and connections among spatial units in limiting remediation success. Progress was made in identifying new methods to modify the spatial distribution of water, with influences on the spatial pattern in plant establishment. Under Objective B.4, we made significant progress in assessing animal productivity under alternative management strategies. Progress was made toward determining the effects of supplementation on palatability of juniper to livestock. Progress was also made in determining market potential for aridland-*

adapted cattle (Criollo) compared to European breeds. Progress was also made in testing inexpensive sensors to gather cattle into corrals using directional virtual fencing technology.

3. Good relation to objectives:

"Progress was made on all three objectives, which fall under NP301. Under Objective 1A, 14 crosses were made…..Under Objective 1B, significant progress was made towards identifying….etc."

"Research was completed on project objectives related to the safety of aquaculture products. These objectives related to the safety of shellfish, which contribute to bacterial and viral illnesses among shellfish consumers. Completed objectives included the development and evaluation of a novel enzyme…."

4. Good general summary for the year:

In 2009, we conducted monitoring and forecasting for stripe rust and provided disease updates to growers in the Pacific Northwest (PNW). Through cooperators in other states, stripe rusts of wheat and barley were monitored throughout the US. As a result of our disease monitoring, accurate forecasting, timely alerts, and advices for disease management, wheat growers appropriately applied fungicides to reduce yield losses. New models were developed to forecast potential stripe rust damage for the PNW and data analyses were finished to determine stripe rust over-wintering and over-summering regions in the US.

We completed testing of 331 stripe rust samples obtained from 20 states in 2008 and we have finished about 50% of more than 300 samples in 2009 to identify races. From the 2008 samples, we identified 11 barley stripe rust races and 33 wheat stripe rust races, of which one new race was identified for each of the stripe rust forms. The information on predominant races is essential to breeding for resistance and disease management.

To support breeding programs in the US, we tested more than 20,000 wheat and barley entries for stripe rust resistance. The data were provided to breeders for developing resistant cultivars and to growers for choosing resistant cultivars to grow. Growing resistant cultivars in the majority of wheat fields prevented the potentially more than 20% yield losses in the PNW and other regions, which saved growers millions of dollars. Through our intensive testing, cultivars with adequate resistance to stripe rust have been developed. In 2009, we cooperated on the pre-release, final release, and registration of 16 wheat cultivars possessing stripe rust resistance with breeding programs in various states.

To identify new genes for stripe rust resistance and develop molecular markers, we completed studies of identifying and mapping two new genes from world wheat germplasms 'PI181434' and 'PI480148' for effective resistance. We made progress on our genetic and molecular mapping studies, and developed new wheat germplasms with high level and durable high-temperature adult-plant (HTAP) resistance to stripe rust through marker-assisted pyramiding of genes previously identified from wheat cultivars 'Alpowa' and 'Express'.

To understand molecular mechanisms of stripe rust resistance, we completed studies to identify unique and common defense genes and their biochemical pathways regulated by various stripe rust resistance genes using a custom wheat genechip. We obtained good molecular data to answer the questions why non-race specific HTAP resistance is durable and the other type of resistance is not durable. In cooperation with scientists in UC Davis and other ARS programs, we cloned the Yr36 gene and published the results in Science.

We evaluated 15 fungicide treatments to control stripe rust. Better chemicals were identified. We also determined potential yield losses of 24 winter wheat cultivars popular in the PNW and their responses to fungicide. These results are useful for registering new fungicides and for growers to choose best fungicides when needed.

4. Good general summary for the year:

We studied native, naturalized, and domesticated stocks of Pacific oysters using AFLP markers and found that although historical accounts say this species was introduced from the Myagi region, domesticated stocks derived from naturalized populations are related to native populations from the Midori/Hiroshima region. This could be the result of domestication selection.

We studied the genetic structure of remnant populations of the Olympia oyster using previously developed molecular genetic markers and demonstrated: 1) regional-scale genetic differentiation among estuary systems and among localities within Puget Sound and SF Bay 2) that re-established populations in Coos Bay are derived from Willapa Bay, and 3) that previous re-stocking efforts can impact the genetic composition of populations through the use on non-local broodstock and bottleneck effects.

In collaboration with the Molluscan Broodstock Program, we deployed for testing and evaluation, second-generation families of novel Kumamoto oyster germplasm collected from the Ariake Sea in 2006 as part of a joint ARS, University of Southern California, and industry effort to replace and/or revitalize existing contaminated and inbred germplasm.

As part of a coordinated effort to address catastrophic mortality in commercial oyster hatcheries, we are conducting mixed-family screening experiments to identify strains that can resist or tolerate the conditions causing them. The trials consist of raising over 100 genetic families under commercial conditions and using parentage analysis to assign survivors to their parents

We initiated collaborative research with the Molluscan Broodstock Program to estimate the genetic (co)variances for larval and post-larval traits with the goal of using this information to incorporate larval survival as a breeding objective without undesirable correlated responses. Developing this project was complicated by ARS' dependence on MBP's hatchery capabilities and MBP's resistance to embracing modern molecular methods.

We collaborated with MBP on a project to estimate the heritability of shell coloration in Pacific oysters. This trait is becoming increasingly important as oyster markets shift away from shucked meats toward the more lucrative half shell trade.

Our use of molecular marker-based parentage analysis to address larval mortality issues is, to my knowledge, the first application of this technology in a shellfish breeding program, and as such constitutes and important "proof of concept" step toward using mixed-family selection for genetic improvement in molluscan shellfish.

We completed laboratory studies comparing gene expression patterns in heat stressed or bacterially challenged oysters from stress-sensitive and stress tolerant families and are currently testing for correlations between expression levels of stress tolerance genes and growth and survival in the field and to map the regulatory regions that determine these expression levels.

We have completed phenotypic-level work and begun genotyping samples from a large QTL mapping experiment to identify genomic regions associated with growth and survival in the field.

5. **Good opening paragraphs to show continuation from old projects:**

"This report documents progress for the parent Project 6612-61660-002-00D Improving Crop and Animal Production Systems for Southern Producers which started Oct 2008 and continues research from Project 6612-61660-001-00D Developing Sustainable Crop and Animal Production Systems Suitable for the Southeast."

"This report documents progress for Project Number 5348-11000-006-00D, which started in March 2010 and continues research from Project Number 5348-1100-005-00D, entitled "Quantifying and Predicting Emission of PM10 and Greenhouse Gases from Agricultural Soils."

6. **Good connection to new project:**

"This project was terminated on December 14, 2008 and replaced with project 5306-21000-019-00D. Details of progress on milestones relating to improving postharvest life of potted plants and cut flowers through the use of molecular and applied technologies research can be found in the 2009 Annual Report for 5306-21000-019-00D."

7. **Good completion statement and connection to new project:**

"This is the final report for Project 5450-51000-041-00D, which has been replaced by new Project 5450-51000-047-00D. For additional information, see the new project report.

General Comments:

NOTE: The responses in Question 3 should give a summary of progress for the **YEAR**, not the life of the project, unless the project is terminating, in which case a summary of the life of the project is required.

NOTE: This question gives the users of the report an idea of how the project is going, what objectives are being met or not met in that year, and what is next. It is not to give the accomplishments, which should be indicated in Question 4.

Question 4: Significant Accomplishments: (See Additional document on accomplishments used in 2011 Explanatory Notes)

General comments:
- Accomplishments are for "selling" the importance of our research to our "customers".
- Accomplishments should point to economic value, value to industry/customers or to current administrative priorities.
- Accomplishments MUST have an outcome/impact statement.
- Many accomplishments are written too scientifically. They need to be written in terms for the general public to understand.
- Accomplishments should be reflective of the objectives on the project.

1. **Examples of accomplishments that have too much experimental data or too technical:**

"Toxoplasma gondii isolates from free-range chickens from the northeast region of Brazil. The prevalence of Toxoplasma gondii in free-ranging chickens is a good indicator of the prevalence of T. gondii oocysts in the soil because chickens feed from the ground. The prevalence of T. gondii in 152 free-range chickens (Gallus domesticus) from 22 municipalities in 7 northeastern states (Pernambuco, Rio Grande do Norte, Maranhão, Bahia, Ceará, Sergipe, and Alagoas) of Brazil was determined. Antibodies to T. gondii were assayed by the modified agglutination test (MAT); 81 (53.3 %) chickens had titers of 1:5 in 26, 1:10 in 9, 1:20 in 4, 1: 40 in 1, 1: 80 in 6, 1: 160 in 6, 1:320 in 13, 1: 640 in 6, 1:1,280 in 3, 1:2,560 in 6, and 1:5,120 or higher in 1. Hearts and brains of 81 seropositive chickens were bioassayed individually in mice. Toxoplasma gondii was isolated from 23 chickens with MAT titers of 1:5 or higher; the isolates were designated TgCKBr165-187. Five isolates killed all infected mice. Results indicate widespread contamination of rural environment in Brazil with T. gondii oocysts. This work relates to NP 108 Action Plan Component 1a, Pathogens, Toxins, and Chemical

Contaminants Preharvest, ii, Epidemiology, to determine the origin and routes of transmission of epizootic pathogens."

"Efficacy-dependent actions of piperidine alkaloid teratogens and enantiomers. Lupines and other plants such as Conium maculatum L., Nicotiana glauca and Nicotiana tabaccum contain toxic and teratogenic piperdine alkaloids in mixtures of enantiomers. Although, the enantiomers have the same physical properties the enantiomers have different physiological properties. A pharmacodynamic comparison of the alkaloids anabasine, anabaseine, anagyrine, ammodendrine, and coniine in two cell lines was made. These alkaloids and their enantiomers were more effective in depolarizing TE-671 cells which express the human fetal-muscle type nicotinic cholinergic receptor (nAChR) relative to SHSY-5Y cells which predominately express human autonomic nAChRs. The rank order of potency in TE-671 cells was: anabaseine > (+)-anabasine > (-)-anabasine > (±)-anabasine > anagyrine > (-)-coniine > (±)-coniine > (+)-coniine > (±)-ammodendrine > (+)-ammodendrine. The rank order potency in SHSY-5Y cells was: anabaseine > (+)-anabasine > (-)-coniine > (+)-coniine > (+)-ammodendrine > anagyrine > (-)-anabasine > (±)-coniine > (±)-anabasine > (-)-ammodendrine. These findings support the hypothesis that the mechanism behind the teratogenic potential of these compounds is the stimulation of muscle-type nAChR followed by desensitization and finally inhibition of fetal movement. This information provides a pharmacodynamic comparison of the alkaloids anabasine, anabaseine, anagyrine, ammodendrine, and coniine in cell lines demonstrated the difference in toxicity between enantiomers."

2. **Accomplishment is "ok", but there is no impact statement:**

"Cryptosporidium oocysts have been found inside plant stomata.   Cryptosporidium is a human and animal parasite found in contaminated water. Fluorescently labeled Cryptosporidium oocysts were found using laser confocal microscopy near and inside plant stomata, the microscopic breathing holes of plants. Washing of contaminated spinach leaves did not remove oocysts protected within the stomata suggesting a potential food safety issue for fresh cut leafy vegetables."

Impact statement that could be added to end of accomplishment: "Newly developed methods have helped identify potential parasites or protozoal contaminates of produce. These technologies will also help identify factors for contamination of produce. Contaminates of produce by water is of importance to food safety and public health."

3. **Good Accomplishments:**

"Adapting NIRS grain technology for detecting traits of disease vectors. Engineers in Manhattan, Kansas developed a technology to measure traits of single wheat kernels using near-infrared spectroscopy (NIRS). This technology can also determine traits of single insects, such as their species and age. In cooperative work with the Centers for Disease Control (CDC) in Atlanta, Georgia and the Ifakara Health Institute in Ifakara, Tanzania, researchers demonstrated that the NIRS technology can determine mosquito species and age with about 90 percent accuracy. These findings are important in monitoring control programs and reducing the proportion of older mosquitoes that have the ability to transmit malaria. The technology has been adopted by the CDC, and researchers in England, Austria, Australia, and Tanzania."

"Increasing yield of ethanol from corn stover. One reason why cellulosic ethanol is much more expensive than corn-based ethanol is that biomass contains both hexoses, such as glucose, and pentoses, such as xylose. Corn-based ethanol is produced with brewers yeast, which converts only glucose. Although new 5 microorganisms have been developed to convert both hexoses and pentoses to ethanol, these recombinant organisms ferment glucose preferentially and do not begin to metabolize pentoses until low glucose concentrations have been reached. As a result, fermentation times are long and the pentoses are not fully converted. To overcome these hurdles, researchers at ARS and Iowa State University co-developed a two-stage simultaneous saccharification and fermentation process. In the first stage, pentoses are released and fermented to ethanol using an organism capable of highly efficient pentose metabolism; in addition, glucose is released

and simultaneously converted to ethanol with brewers yeast. Using this process, an ethanol yield of 85 gallons per ton was achieved from corn stover. If the traditional process that ferments only glucose had been used, the yield would have been only 65 gallons per ton."

"A method for determining whether piglets receive adequate colostrum from the sow. Preweaning mortality of piglets represents a substantial loss to swine producers. One possible factor contributing to this loss is the failure of neonatal piglets to obtain sufficient colostrum from the sow which can be caused by either failure of the piglet to nurse, or failure of the sow to initiate lactation. An inexpensive and rapid method, the "immunocrit," was developed and validated by ARS scientists to measure newborn piglet serum immunoglobulin G (IgG), which reflects whether a piglet has received adequate colostrum. Results indicated that immunocrit measurements are predictive of piglet mortality, and litter average immunocrit indicated the ability of the sow to transmit IgG (via colostrum production). Low immunocrit values were primarily due to the failure of individual piglets to nurse and not due to failure of the sow to produce colostrum. Litter average immunocrit can be used to identify sows that fail to initiate colostrum 9 production enabling selection for efficient IgG transfer (presumably efficient colostrum production) from sow to piglet. The immunocrit has been adopted by industry to monitor and manage newborn piglet colostrum intake which will increase piglet survivability to weaning, increasing production efficiencies for the pork industry."

"Noninvasive tenderness prediction system accurately predicts tenderness of most major beef muscles. The U.S. beef industry and the Agricultural Marketing Service (AMS) have sought implementation of standards for tenderness. ARS scientists previously developed a noninvasive method to predict tenderness of the ribeye muscle of beef carcasses based on visible and near infrared (VISNIR) spectroscopy. Under a research agreement between ARS and the National Cattlemen"s Beef Association, ARS scientists determined that the existing system could also predict tenderness of other muscles of the carcass. Similar results were obtained with the application of VISNIR directly to the exposed gluteus medius on the anterior end of top sirloin subprimals, either during carcass fabrication or after aging. These results suggest this technology can be efficiently and cost effectively utilized by industry to control variation in tenderness which will greatly enhance consumer acceptance and consumption of U.S. beef products."

"Improved catfish feed conversion through pond oxygen management. Dissolved oxygen (DO) is the most critical water quality parameter in warmwater aquaculture. Controlled studies on the impact of DO fluctuations on channel catfish have been lacking. ARS researchers at Stoneville, Mississippi examined the impact of DO concentrations on catfish growth, food consumption, and food conversion. Results showed that higher DO concentrations (2.5-3.0 milligrams per liter) are required for optimum food conversion and growth, and this improved growth will significantly shorten the production cycle. Increased growth resulting from improved DO management can reduce food conversion ratios from an estimated industry-wide 2.5-3.0 down to 2.0, greatly improving the profitability of catfish farming."

"Cacao genome sequenced. Cacao, the source of chocolate, is a multi-billion dollar international commodity grown by several million small farmers in tropical developing nations. Threatened by many virulent diseases and damaging pests, cacao requires new tree types with inherent resistance to pests and diseases, plus high yields and fine cocoa quality. Currently, cacao breeders lack DNA genetic markers required for rapid selection of trees with desired traits at the seedling stage, rather than at maturity. ARS scientists in Miami, Florida and Stoneville, Mississippi, with collaborators at Mars, Inc., IBM, and several U.S. universities enlisted a novel mixture of traditional and leading edge techniques to fully sequence the 12 genome of a particular cacao variety that shares ancestry with many of the trees grown worldwide. This genome sequence can now be compared with genetic information from other cacao varieties with different properties to rapidly identify many thousands of genetic markers, and thereby accelerate cacao genetic improvement to benefit farmers and cocoa processors globally."

4. Accomplishment written for a specialist, not the general public:

"Assessment of Cellular Responses Against Edwardsiella (E.) ictaluri. Edwardsiella ictaluri, the causative agent of enteric septicemia in channel catfish, accounts for considerable economic loss to the aquaculture industry. The result of the interactions of catfish macrophages with E. ictaluri revealed that only macrophages from AQUAVAC-ESC immunized catfish were efficient in killing E. ictaluri. Macrophages from nonimmunized fish allowed both the internal survival and replication of E. ictaluri. The macrophages from immunized catfish had increased levels of killing agents, reactive oxygen species and nitric acid. The AQUAVAC-ESC vaccine, developed by Agricultural Research Service (ARS) and licensed was demonstrated to protect fish by enhancing macrophage killing activity."

5. Example of accomplishment as written below is really progress, not an accomplishment:

"Anaerobic soil disinfestation as an alternative to methyl bromide fumigation. A cooperative research project with the University of California, Santa Cruz has resulted in the generation of new information on a technique that utilizes the combination of composted broiler litter and a carbon source with soil saturation and heating to create an anaerobic condition that induces weed, nematode, and soilborne plant pathogen control. Greenhouse and field trials conducted by California cooperators allowed for the identification of an optimal approach for Florida trials in which multiple water levels were tested with molasses and broiler litter. When soil was amended with both litter and molasses, the effect on anaerobicity was stronger than that of either broiler litter or molasses alone. This approach was successful using a previously formed false bed. Control of yellow nutsedge emerging though the plastic early in the season in plots receiving the combination was equivalent to methyl bromide. At pepper harvest there were few significant differences between ASD treatments and the untreated check with regard to nutsedge emerging through the plastic. However, total weed biomass harvested from transplant holes at pepper harvest indicated that weeds in treatments including amendment with either molasses or broiler litter, regardless of applied irrigation, were controlled as well as with methyl bromide. Weed control with solarization alone was also better than the untreated check, though not equivalent to methyl bromide. Control of Phytophthora capsici, introduced in buried inoculum in nylon mesh bags, was equal to that of methyl bromide for all treatments except the untreated check. There was an indication of increased numbers of non-pathogenic, beneficial nematodes in some treatments. The weed control observed during the bell pepper trial was maintained during the eggplant double crop."

6. Too much detail in accomplishment..should be summarized:

"Tool developed to simultaneously assay thousands of grape genes: Penicillum expansum and Colletotrichum acutatum cause postharvest decay of apple fruit resulting in significant economic losses during storage. However, little resistance to both pathogens exists in the domesticated apple gene pool. Therefore, a collection of wild apple (Malus sieversii) germplasm from Kazakhstan (apple center of origin), located and maintained at PGRU was evaluated by ARS scientists in Kearneysville, WV and Beltsville, MD for resistance. Fruits from over 175 Kazakh M. sieversii accessions were harvested at various stages of maturity and were wound-inoculated with conidial suspensions of P. expansum and C. acutatum. Twenty inoculated fruit per conidial concentration from each accession were incubated at 24°C for 5 (for P. expansum) or 6 days (for C. acutatum) and then evaluated for decay incidence and severity. For P. expansum, 7 accessions were classified as immune (no decay at both conidia concentrations), 38 as resistant (no decay at 103 conidia mL-1), 142 as moderately resistant (lesions <10mm at conidia 103 mL-1), and 3 as susceptible. For C. acutatum, 1 accession was categorized as immune, 12 were resistant, 97 were moderately resistant, and 65 were susceptible. Differences in individual host resistance against both pathogens were expected due to differences in fungal lifestyles exhibited by P. expansum and C. acutatum. Both resistant and immune Kazakh accessions can serve as a source of genetic material in breeding programs and may be used in molecular studies to identify the genetic component(s) of host resistance to these important postharvest pathogens."

7. Not an accomplishment:

"Field Studies of Grafted Tomato and Musk melon. Concluded with collaborators initial field studies on tomato and musk melon growth in fumigated and non fumigated soils. Data is currently being analyzed."

8. **Not enough information for accomplishment and no impact statement:**

   "Flame- and stain-resistant cotton. Epoxy-based chemical formulations and their reactions on cotton can serve as models for future (diversified) cotton fiber finishing technology, which may be applied to attain durable (wash-fast) flame- and stain-resistances of cotton fabrics."

Question 5: Significant Activities that Support Special Target Populations:

Note: Question 5 should only be answered if there are activities that support special target populations. If none, it is okay to leave this question blank.

1. "*A Specific Cooperative Agreement entitled "Vegetable Production in the Southeast: Promoting Conservation Tillage Systems to Increase Yields, Profitability, and Improve Soil Quality" with Tuskegee University was created to work with limited-resource vegetable growers selected from within the Black Belt or Prairie soil region of Alabama to: 1) develop vegetable cropping systems that increase soil organic carbon and improve efficiency of organic nitrogen applications; reduce soil compaction; and reduce nutrient and soil losses through runoff; 2) network with limited-resource farmers to improve their access to agronomic information; and 3) provide technical and analytical support for sustainable soil management to limited-resource vegetable producers. Additional details can be found in the annual report for this project.*"

2. *Scientists have participated in activities targeting minority, historically under-served operators/stakeholders including: 1) collaborator on a SARE grant awarded to 1890s institution Fort Valley State University, and a SARE grant awarded to this USDA, ARS station with Fort Valley State University listed as a co-principal investigator; 2) cooperator on Capacity Building Grants awarded to Fort Valley State University, Delaware State University, and Virginia State University; 3) participant in meetings of the Southern Consortium for Small Ruminant Parasite Control, attended by 1890s institute representatives from Fort Valley State University, North Carolina A&T State University, Delaware State University, and Hispanic-serving University of Puerto Rico; 4) collaborator with Virginia State University and Langston University on research projects involving small ruminant parasite control; 5) collaborator with University of Maryland Eastern Shore on implement to incorporate poultry litter into soil for fertilizer.*

   Scientists have participated in activities targeting small farmers, including: 1) education of small ruminant extension agents and producers in the use of methods to control gastrointestinal parasites; 2) review panel for Southern Region SARE producer grants; 3) on-farm organic research in small ruminants at the Heifer Ranch of Heifer International, Perryville, Arkansas, and two private farms in Oklahoma; 4) preparation for a field day for small ruminant producers.

3. *Visited the fifth grade classes at Los Padres School, an elementary school in Salinas serving primarily Hispanic students, and presented lessons and experiments related to general plant and animal biology.*

   Hired two Hispanic summer internship students from Hartnell College, a Hispanic-Serving Institution and local community college.

   Contributed to two classroom presentations in four 5th grade classes at a local minority serving elementary school that has been adopted by our research station to provide science programming and field trips.

Question 6: Technology Transfer

New CRADA:

Title: DEVELOPMENT OF ANTIBODIES SPECIFIC FOR CITRUS TRISTEZA VIRUS FOR USE IN ELISA
Cooperator: (*cooperator name*)
Description: Development of antibodies specific for Citrus tristeza virus for use in ELISA
Transfer: Antibodies and antigens specific for Citrus tristeza virus for use in coating and detection of ELISA protocols.
Customer/User: Certification programs, research institutions, and diagnostic laboratories.
Impact/Outcome: Provides an economical means of detection Citrus tristeza virus by regulatory agencies and diagnostic laboratories as needed for management of tristeza disease.

Active CRADAs:

Title: THE IMPACT OF THE NEW HARVESTING TECHNOLOGY ON COTTON QUALITY
Cooperator: (cooperator name)
Description: Technology: A new system Pinnacle® has been developed by (cooperator name) that revolutionizes the way seed cotton is harvested and modularized in the field.
Transfer: Personnel of CQRS have tested the fiber and processed into yarn conducted all pertinent tests and reported the results to (cooperator). Preliminary results indicate that Pinnacle® harvested cottons have a slightly improved quality with respect to cotton grown side by side and harvested conventionally.
Customer/User: Principal beneficiaries are first the producer (farmer) for it should improve his efficiency and then the textile mills who can receive improved quality raw materials and finally the consumer.
Impact/Outcome: The technology has the potential for producing high quality cotton with lower cost and energy consumption.

Title: MECHANIZATION OF IN VIVO PRODUCTION OF ENTOMOPATHOGENIC NEMATODES IN TENEBRIO MOLITOR
Cooperator: (cooperator name)
Description: Technology: Insect-killing nematodes can be potent natural biopesticides capable of suppressing a range of economically important pests. Novel methods to enhance production methods for these nematodes are required to expand the usage of these promising biocontrol agents. This project is aimed at mechanizing and optimizing host insect and nematode production systems. Advancements have been made in vivo production of mealworms and nematodes for application in aqueous suspension or infected host cadavers.
Transfer: The novel production technology is being developed cooperatively with a private company, and thus direct commercial application will ensue with this company. Modest sales have already been initiated utilizing the technology. Three invention disclosures have been submitted based on the novel technology; these inventions will be used by the CRADA partner and or licensed to other commercial interests.
Customer/User: The target customers are primarily commercial biological control companies. Additionally, the scientific community will benefit from the development of the new methods in nematode biocontrol production, and the general public will benefit from greater access to environmentally sound biological pest control products.
Impact/Outcome: The novel technology translates into more efficient production of insect-killing nematodes as environmentally sound biological products for insect suppression. The improved technology leads to reduced costs and greater pest control efficacy.

Title: CORN CREAM FROM ALTERED FATTY ACID LINES
Cooperator: (cooperator name)
Description: Corn cream from altered fatty acid lines.
Transfer: Two isolations of corn grown in 2008 were delivered to the (cooperator name) pilot plant for processing into proprietary corn cream.
Customer/User: Corn cream from corn with healthier amino acid balances will be manufactured by (cooperator name) for use by food companies in various products, such as ice cream. Our corn will be grown by small farmers, some of whom will be organic.

Impact/outcome: Increasing levels of obesity in the American population is a contributing factor to the health care crisis in this country. Our corn combined with (cooperator name) technology will lead to healthier products in the marketplace. Providing the grain for this product will lead to increased profitability for organic and non-GMO corn farmers.

New/Active MTAs:

Description: Investigate the behavior and ecology of western corn rootworm larvae combined with applied aspects of its control.
Transfer: Western corn rootworm eggs and rearing expertise.
Customer/User: Cooperating scientists with (cooperator name).
Impact/Outcome: New scientific information to help manage western corn rootworm populations.

Description: Evaluate the efficacy of insect traits in new corn varieties.
Transfer: Western corn rootworm eggs and rearing expertise.
Customer/User: Cooperating scientists with (cooperator name).
Impact/Outcome: Provide growers with new corn varieties that resist feeding damage caused primarily by corn rootworm larvae.

Description/transfer: MTA for transfer of germplasm from the USDA breeding program to commercial producers. Germplasm will be used as a multiplier source for future salmon broodstock or commercial production.
Customer/User: Commercial Atlantic salmon producers
Impact/Outcome: This MTA was used to facilitate the transfer of salmon from ARS to commercial salmon producers through the industry's Maine Aquaculture Association. Utilization of improved germplasm will increase the profitability and sustainability of coldwater marine aquaculture in the U.S. and provide a quality seafood product to U.S. consumers.

Description: The materials will be shared with a researcher at the (cooperator name). The genes will be used in research related to biodiesel production in the Barbados nut shrub.
Technology: Efficient, economical production of biodiesel from plant oils requires maximization of oil yield per unit of land used to grow the plants, and requires that the oil made by the plants contains a suitable profile of fatty acids in the oil that will impart the desired properties to the fuel produced. DGAT genes are a necessary component for making any seed oil. Two DGAT genes from tung will be introduced into Barbados nut shrub, a promising biodiesel crop plant. Oil will be extracted from the seeds of the resulting plant lines, and analyzed for improved biodiesel qualities.
Transfer: DNA samples containing either tung DGAT1 or tung DGAT2, each present in a form compatible with introduction into cells of Barbados nut shrub, were sent to the collaborators.
Customer/user: This research is in the very early stages, but if successful, future users and customers could include all purchasers of biodiesel for use in automobiles or other motorized vehicles or equipment.
Impact/Outcome: Anticipated outcome is a better understanding of the utility of DGAT genes in the production of biodiesel oils, and plant seed oils in general, in commercially important oilseed crops. Specifically, one possible outcome will be the production of new varieties of nut shrub-derived biodiesel fuels with novel qualities and uses.

Invention Disclosures Submitted:

Title: (title of invention disclosure)
Description:
Technology: (description of the technology/title)
Transfer: Invention disclosure that will hopefully lead to a patent and commercialization by an irrigation system manufacturer.

Customer/User: The primary customer is a manufacturer of irrigation or irrigation control equipment. The secondary customer is the irrigation manager/agricultural producer who purchases and uses the system.
Impact/Outcome: The system has been shown to control irrigation, resulting in yields and water use efficiencies as good as or better than those possible using expensive and time-consuming scientific irrigation scheduling tools, such as the neutron probe, which are impractical for producers. Thus, the system will enable producers to more routinely obtain high yields and water use efficiencies, thereby improving environmental and economic sustainability of agricultural production. In addition, the technology can be tuned to produce larger water use efficiencies without severely limiting yields, which can allow a producer to improve nutrient use efficiency, decrease pumping costs, and find the economic sweet spot.

Patent Applications Filed:

Title: ELECTRONIC TERMITE DETECTION SYSTEM
Description: A new monitor to detect termites in structures.
Technology: New sensors coupled with electronic filtering and amplification allows early detection of termites in structures.
Transfer: Patent application filed 03/19/2009.
Customer/User: Pest Management Professionals/ Home monitoring services.
Impact/Outcome: Adoption of this technology would allow detection of termite infestations of structural wood at a very early stage, prior to disruption of structural integrity. This would allow pest management professionals to kill the termite infestation before significant damage to the structure.

Title: INSECTICIDES AND METHODS FOR KILLING INSECTS
Description: New chemistries that might form the basis for the development of natural products as termiticides.
Technology: A series of natural product chemicals and analogs that exhibit outstanding insecticidal activity, including termites.
Transfer: Patent application filed 09/08/2008.
Customer/User: Pesticide manufacturers.
Impact/Outcome: These chemicals form the basis for development of new classes of chemicals that may be used to control termites based on natural product chemistry. Further chemical modification could provide long-lived but environmentally benign chemicals that could be used to kill termite infestations or protect wood from termite attack.

New Commercial Licenses Granted:

Title: (cooperator name)
Description: Technology: Four ornamental pepper (Capsicum) germplasm releases were licensed to a major U.S. nursery, and are currently being propagated for projected commercial release in 2011. Patents have been issued on two of the licensed releases (all jointly with the Genetic Improvement of Fruits and Vegetables Laboratory; project Genetic Enhancement of Quality Constituents in Solanaceous Vegetables', 1275-21000-195-00D).
Transfer: Commercial licenses were issued.
Customer/User: A commercial nursery producing ornamental peppers and other crops.
Impact/Outcome: These releases are expected to be available for retail sale in 2011, expanding consumer choices for ornamental peppers.

Websites Managed:

http://ww.ars.usda.gov/mwa/cdl:

The Cereal Disease Laboratory manages an extensive national system for tracking cereal rust onset and development in the U.S. The observations and biweekly rust bulletins are maintained in a searchable online database (from 1997 to present; bulletins from 1994 to present). Results of annual race surveys, germplasm evaluations (rust evaluations of cultivars and lines of annual national nurseries, Ug99 nurseries, etc. including gene postulations) and annual reports on losses due to cereal rust are available. Extensive fundamental information, e.g., identification and life histories of cereal rusts, catalog of rust resistance genes, comprehensive bibliographies (cereal rusts, Fusarium head blight and Karnal bunt), alternate host barberry, Fusarium International Genomics Initiative project information, etc. is provide on the website. All information on the website is publicly available.
Transfer: Website had 38,855 visits (activity of one visitor) and 92,415 hits from June 1, 2009 to June 1, 2010.
Customer/User: Federal, state and local researchers, extension personnel, students, commodity and farm groups and the public. Over 400 individuals are subscribed to our Cereal Rust Survey and Cereal Rust Bulletin listserv lists.
Impact/outcome: Provides the most comprehensive source of information on the current and past cereal rust situations in the U.S. while facilitating access to cooperators around the U.S. Additionally, provides fundamental information on the cereal rusts, cereal rust resistance genes, germplasm evaluations, cereal rust resistance gene postulations, annual cereal rust race surveys, etc. necessary in the effort to minimize the impact of cereal rusts. This website is the central location for the Fusarium International Genomics Initiative project.

http://entoplp.okstate.edu/gbweb/
Technology: Efficient greenbug pest management is critical to minimize economic losses to wheat growers caused by the pest. The "Greenbug Management Decision Support Tool" is a computer-based expert system that guides the user through the process of determining economic thresholds and obtaining field sampling data forms. Information on other aspects of greenbug pest management, such as biocontrol and insecticide selection, is also provided. Access to the expert system is free of charge to the general public.
Transfer: The Greenbug Management Decision Support Tool is available at http://entoplp.okstate.edu/gbweb/.
Customer/User: The software is designed for crop consultants, wheat producers, and pest management scientists.
Impact/Outcome: We do not keep track of the number of people who access the website. However, we know that extension specialists throughout Oklahoma and Texas rely heavily on the system when greenbug outbreaks occur, and some train crop consultants and growers on its use.

http://www.cottondb.org/
Technology: CottonDB (http://www.cottondb.org/), a cotton database maintained by the project, provides detailed genomic, genetic, germplasm, and taxonomic information for cotton (Gossypium spp.). CottonDB serves as both an archival database and a dynamic resource for research activities.
Transfer: In FY 2009, the CottonDB website had over 100,000 visits and over 2,100,000 hits from users in over 50 countries.
Customer/User: Domestic and international cotton research community.
Impact/Outcome: Provides a single source site for diverse databases that support genomic and genetic investigations, and which will facilitate discoveries that will positively impact cotton improvement efforts and benefit the U.S. cotton industry and the consumer.

http://icgi.tamu.edu
Technology: The website http://icgi.tamu.edu/ for the International Cotton Genome Initiative is cooperatively maintained by the project and Texas A&M University, and provides activity information, organizes biannual conferences, conducts organization elections, maintains membership lists and addresses, and provides a forum for membership communication.
Transfer: Website had more than 30,000 visits and more than 200,000 hits from users in FY 2009.
Customer/User: International cotton research community
Impact/Outcome: Facilitates global communication, technology and resource development and sharing, and coordinated research planning that positively impact basic cotton genome and genetics research.

www.tucson.ars.ag.gov/awgwa
Technology: Automated Geospatial Watershed Assessment (AGWA)

Transfer: AGWA Web Site(www.tuscan.ars.gov/agwa)-includes software, documentation, tutorials, presentations, and publications.
Customer/User: Other Federal, local and state government agencies; consultants, researchers and graduate students
Impact/Outcome: To date, over 1500 users from 85 countries for AGWA 1.5 and 945 users from 110 countries have registered and downloaded the AGWA 2.0 software. AGWA has become an accepted tool within the environmental management and protection community and has been used with significant positive impact within the past three years with formal adaption by branches of EPA and NASA in addition to extensive use by USDA, USDOI, and DOC (NWS) and by consultants and research investigators and students. AGWA received the ARS 2008 Technology Transfer Award presented in Feb. 2009.

Other Technology:

Technology: Integrated Farm System Model, a farm simulation model useful for evaluating and comparing integrated crop, dairy or beef production systems.
Transfer: Internet distribution
Customer/User: Scientists, educators, farm consultants and producers interested in studying management effects on farm performance, environmental impact and profitability.
Impact/outcome: Over 330 copies of the software tool were distributed during the past year for use in classroom teaching and individual evaluation of farming systems.

Technology: Wind Erosion Prediction System (WEPS) model.
Transfer: 60+ copies of the WEPS model were downloaded via the internet.
Customer/User: The customers ranged from NRCS personnel, university researchers and educators, private consultants, and national, state and local government agencies from over 16 countries.
Impact/Outcome: Expanded use of the WEPS model for conservation planning, environmental assessments, and developing control strategies.

Technology: The Beta WinDAMb (Windows Dam Analysis Modules for breach) model used for evaluating earthen embankments during overtopping in flood stages to predict potential erosion and failure.
Transfer: Training/testing sessions held at the USDA-ARS Hydraulic Engineering Research Unit in Stillwater, Oklahoma, to teach engineers about the technology behind the model, how to set up data sets, how to run the model, and how to test the model.
Customer/User: Engineers from the USDA Natural Resources Conservation Service.
Impact/Outcome: The model and components of the model are being developed to predict erosion and failure of embankments during overtopping flooding.

Technology: The ALMANAC (Agricultural Land Management Alternatives with Numerical Assessment Criteria) model used for simulating grasses, especially switchgrass for biofuel.
Transfer: Training sessions held at Temple to teach researchers how to set up data sets and run the model.
Customer/User: Researchers at University of Tennessee, University of Missouri, University of Illinois, and University of Nevada at Reno.
Impact/Outcome: The model and components of the model are being used to assess the feasibility and impact of switchgrass production on a range of soils in different regions of the U.S. to assess impacts of NRCS programs on range sites in the Intermountain West, and to determine the optimal sites of growing plant varieties produced by USDA-NRCS Plant Materials Centers in the Intermountain West.

PLEASE NOTE: The two numerics for invited talks, conferences, presentations, etc., were eliminated as the information was not being used, so we did not want to waste the scientists' time. If the scientists still want to provide the information, it should be summarized as shown below, not as individual entries for each item.

Technology: Understanding crop responses to global atmospheric change
Transfer: One invited conference talk, four conference posters, five presentations for non-science audiences, guest lectures at the University of Illinois Plants and Global Change course
Conferences:
• American Society of Plant Biology Annual Meeting, Honolulu, HI
• Ecological Society of America Annual Meeting, Albuquerque, NM
• Effects of Climate Change on Plants: Implications for Agriculture at Rothamsted, United Kingdom
Non-science audiences:
• REACT: Reaching and Educating America's Chemists of Tomorrow speaker
• Girl Scout Troups
• Farmer Groups from Argentina
• Illinois Soybean Association
• Ag Roundtable Group
• Tribal communities of the Great Lakes Basin
Customer/User: Other scientists, students, producers, general public
Impact/Outcome: Informed understanding of climate change anticipated in 2050, and crop responses to climate change.

Question 7: International Cooperation/Collaboration:

Brazil:
A proposal was written and accepted to fund a post-doc to spend one year at our laboratory. The post-doc will be funded by the Brazilian national agricultural research agency, EMBRAPA. The collaborative research encompasses development of a GIS coupled with a simulation model to estimate corn and soybean yields in the Upper Mississippi Valley of the U.S. under current and elevated CO2 conditions. Once the methodology is perfected, the approach will be transferred to Brazilian agricultural lands.

Rep of Korea:
An ARS scientist from the Davis location has conducted an informal collaborative study with colleagues at Gwangju Institute of Science and Technology, Gwangju, Korea. The overall objective of this continuing collaboration is to examine the inhibitory effects of phytochemicals on induction of inflammation via activation of immune cells in culture. These study will improve the scientific basis of US dietary guidelines pertaining to decreasing the risk of chronic inflammatory disease by making appropriate food choices. This year the collaborating scientists found that the plant polyphenol isothiocyanate decreased activation of inflammation by inhibiting a sensory molecule on immune cells, toll like receptor 4 (TLR4), that detects microorganisms and initiates transcription of proinflammatory genes. This activity was inhibited. The bench work was conducted in Korea and scientists communicated via e-mail and one visit by the Korean investigator to Davis.

Japan:
An ARS scientist at the Davis location is conducting informal, collaborative research with a scientist at the National Institute of Advanced Industrial Sciences and Technology, Osaka, Japan. The immediate goal of the research is determine the impact of dietary interventions with different types of fatty acids on lipid peroxidation in plasma and red blood cells. The overarching goal of the project is to help define how dietary patterns associated with chronic disease affect physiologic process, such as lipid peroxidation, that may directly or indirectly (e.g., by triggering inflammation) cause tissue damage and lead to development of disease, such as diabetes. Samples from experiments conducted by the ARS with in-house funds in Davis were sent to Osaka for analysis and data were sent

electronically to Davis for statistical analysis. The collaboration was conducted largely via e-mail but the collaborating scientist from Osaka visited Davis this year for face-to-face discussions.

Examples of good/complete annual reports:

Refer to the 2009 Annual Reports for Project Nos. 6202-32000-024-00D and 6202-32000-021-00D.